# Third Five-Year Review Report

For

Helena Chemical Co. Landfill SCD058753971

City of Fairfax Allendale County, South Carolina

September 2014

United States Environmental Protection Agency Region 4 Atlanta, Georgia

Approved by

Randall Chaffins

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Date:

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# LIST OF ACRONYMS

AOC Administrative Order on Consent

ARAR Applicable or Relevant and Appropriate Requirement

bgs below ground surface BHC Benzene Hexachloride

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CFR Code of Federal Regulations

CIC Community Involvement Coordinator

COC Contaminants of Concern
DDD Dichlorodiphenyldichloroethane
DDE Dichlorodiphenyldichloroethylene
DDT Dichlorodiphenyltrichloroethane

EPA United States Environmental Protection Agency EPN Ethyl p-nitrophenyl thionobenzene phosphonate

ESD Explanation of Significant Difference

FS Feasibility Study
FYR Five-Year Review
gpm gallons per minute

HCC Helena Chemical Company
HRS Hazard Ranking System
IC Institutional Control

LTTD Low Temperature Thermal Desorption

MCL Maximum Contaminant Level mg/kg milligrams per kilogram

NCP National Oil and Hazardous Substances Pollution Contingency Plan

NPDES National Pollution Discharge Elimination System
NPDWR National Primary Drinking Water Regulations

NPL National Priorities List
O&M Operation and Maintenance

OU Operable Unit

POTW Publicly owned treatment works
PRP Potentially Responsible Party

RA Remedial Action

RAO Remedial Action Objective

RCRA Resource Conservation and Recovery Act

RG Remedial Goal
RI Remedial Investigation
ROD Record of Decision

RPM Remedial Project Manager

SARA Superfund Amendments and Reauthorization Act

SCDHEC South Carolina Department of Health and Environmental Control

TBC To Be Considered TBD To Be Decided

VOC Volatile Organic Compound

μg/L microgram per liter

# **Executive Summary**

The Helena Chemical Company (HHC) Landfill Superfund site (the Site) is located in Fairfax, South Carolina. Agricultural pesticides were produced at the Site from the 1960's to 1979. A 4-acre area on the northeast portion of the Site was utilized as a former landfill. The former landfill contained pesticide residues and other waste materials generated on-site. The United States Environmental Protection Agency (EPA) placed the Site on the Superfund program's National Priorities List (NPL) in 1990. In 1993, the EPA issued a Record of Decision (ROD), selecting a remedy for the Site. The ROD was amended in 1995 and again in 1998.

The selected remedy for the HCC Landfill site in Fairfax, South Carolina included excavation of contaminated soils and sediments on-site, institutional controls (IC), and extraction of contaminated groundwater by means of a single recovery well. The Remedial Action Objectives (RAOs) for this remedy were to control risks posed by direct contact to contaminated media including; soil, sediment and groundwater, and to minimize migration of contaminants in groundwater.

The remedial action addressed on-site soil contamination, the principal threat at the Site; as well as on-site and off-site groundwater contamination. The major components of the selected remedy included the following:

#### Source Control

Excavation of contaminated surface and subsurface soil to 3 feet, with verification sampling; Site re-grading to prevent uncontrolled storm-water runoff into waters of the State or the United States.

#### Groundwater

Extraction of contaminated groundwater from the surface (shallow) aquifer; Treatment and discharge of the treated groundwater to a local Publicly-Owned Treatment Works (POTW) facility.

### Mitigation for Adverse Impacts to Wetlands

Mitigation for adverse impacts to environmental receptors in accordance with regulatory guidelines established under the authority of Section 404 of the Clean Water Act.

### Site Monitoring

Quarterly sampling of groundwater and nearby public water supply to monitor the concentrations and movement of contaminants in affected and potentially affected aquifers. The goal of the selected remedial action was to restore the impacted groundwater to levels below that of applicable Maximum Contaminant Levels (MCLs), i.e., drinking water standards. The Site achieved construction completion with the signing of the Preliminary Closeout Report on September 13, 1999.

#### **Technical Assessment**

Both the shallow and deep groundwater plumes appear to have migrated beyond perimeter wells located on-site and the groundwater plume is undefined. The migration of groundwater and increasing contaminant concentrations in groundwater wells at the Site indicate the remedy is not performing as intended. Increasing sediment contaminant concentration data also indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased in the wetland. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Additionally, the migration of contamination offsite in surface water, or leaching of contamination to groundwater should be considered as new or expanding exposure pathways.

During this Five-Year Review, institutional controls were also evaluated. On May 23, 2014 Helena Chemical Company submitted a copy of a Notice of Hazardous Waste that has been placed on parcel 124-00-00-013. Additional review by EPA determined that a restrictive covenant should be placed on parcel 124-00-00-014, 124-00-00-024 and any properties that have been impacted by the migration of contaminated groundwater.

During the FYR local authorities and nearby residents were interviewed. The vapor intrusion pathway was evaluated during the previous FYR. During the evaluation, it was determined the pathway was incomplete, and despite the presence of Volatile Organic Compounds (VOCs) present in groundwater at elevated concentrations, the current levels of VOCs in groundwater at the site do not exceed EPA risk targets for potential indoor air risk for both a commercial/industrial and the residential use scenario. However, vapor intrusion data should be verified with soil gas data if residential development is considered for the Site.

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented.

Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

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# Five-Year Review Summary Form

	THE PARTY OF	Transfer of the same				
		SITE IDEN	TIFICATI	ON		
Site name (from WasteLAN): HCC LANDFILL						
EPA ID (from Was	steLAN): SCD0587	53971				
Region: 4	State: South Carolina	City/County	: Fairfax/All	lendale		
		SITE	STATUS			
NPL status: 🛛 F		Other (spe				
Remediation state	us (choose all that ap	oly): Under	Construction [	Operating Complete		
Multiple OUs?*	J YES ⊠ NO	Construction	completion da	ite: 09/13/1999		
Has Site been put	into reuse? 🗌 Y	ES 🛮 NO				
		REVIE	W STATUS			
Lead agency: 🛛	EPA State	Tribe Oth	er Federal Agen	icy		
Author name: T						
Author title: Environmental Health Manager Author affiliation: SCDHEC						
Review period**: 03/18/2014 - 06/06/2014						
Date(s) of site ins	pection: 03/25/201	4				
Type of review:						
	☑ Post-SARA**		☐ Pre-SARA	☐ NPL-Removal only		
]	Non-NPL Reme	dial Action-site		□ NPL State/Tribe-lead		
[	Regional Discre	tion				
Review number: 1 (first) 2 (second) 3 (third) Other (specify)						
Triggering action:						
[	Actual RA*** On	-site Construction	n at OU#	Actual RA Start at OU# 1		
[	Construction Com	pletion		☐ Previous Five-Year Review Report		
[	Other (specify)			— mport		
Triggering action	Triggering action date (from WasteLAN): 09/17/2009					
Due date (five years after triggering action date): 09/17/2014						

<sup>\*\*[&</sup>quot;SARA" refers to Superfund Amendments and Reauthorization Act]

\*\*\*["RA" refers to Remedial Action]

# [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

# Five-Year Review Summary Form (continued)

Issues/Recomm	Issues/Recommendations					
OU(s) without Is	sues/Recommenda	ations Identified in	the Five-Year Re	view:		
None						
Issues and Reco	mmendations Ider	tified in the Five-	ear Review:			
OU(s): OU1	Issue Category:	Monitoring				
	Issue: Extent of g	roundwater plume r	not adequately deli	neated.		
		n: Install additional of the contaminated		to adequately		
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date		
No	Yes	PRP	EPA/State	06/01/2015		
OU(s): OU1	Issue Category: F	Remedy Performan	ce			
	<b>Issue:</b> The current groundwater recovery system is not fully capturing the contaminated groundwater plume.					
	current groundwat	n: Additional recove er recovery system ninated groundwate	needs to be impro			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date		
No	Yes	PRP	EPA/State	06/01/2015		
OU(s): OU1	Issue Category: I	nstitutional Controls	3			
	Issue: There are no institutional controls in place to prevent access to contaminated ground water.  Recommendation: Institutional controls should be implemented on par 124-00-00-014 and all other parcels affected by the migration of contaminated groundwater.					
Affect Current Protectiveness	Affect Future   Implementing   Oversight   Milestone Date   Party   Party					
No	Yes	PRP	EPA/State	06/01/2015		

# Five-Year Review Summary Form (continued)

OU(s): OU1	Issue Category: Monitoring				
	Issue: Chromium speciation in groundwater needs to be performed to determine the percent of Cr+6.				
	Recommendation: Chromium speciation should be performed on 20% of the samples to provide information that can be used to determine the potential percentages of Cr+6 in the total chromium results.				
Affect Current Protectiveness					
No	Yes	PRP	EPA/State	06/01/2015	

OU(s): OU1	Issue: Ecological risk assessment data needs to be updated.  Recommendation: Additional risk assessment work should be conducted to incorporate the wider set of receptors including aquatic-dependent wildlife and carnivorous wildlife, as was originally proposed. The contamination in the wetland has increased in magnitude and extent. The current ecological risks at the site exceed the degree of risks understood at the time the wetland mitigation remedy was selected. The increasing concentrations of pesticides in the wetland represent a new exposure pathway. Recommended inclusion of an assessment endpoint to protect the soil invertebrate community.				
Affect Current Protectiveness	Affect Future   Implementing   Oversight   Party   Party   Milestone Date				
Yes	Yes PRP EPA/State 06/01/2015				

OU(s): OU1	Issue Category: Changed Site Conditions				
	Issue: Toxicity data needs to be updated.				
	Recommendation: The cleanup goal for wetland soils should be revised to create separate goals for individual pesticides using updated toxicity values and exposure assumptions.				
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date	
Yes	Yes	PRP	EPA/State	06/01/2015	

Environmental Indicators
<ul> <li>Current human exposures at the Site are not under control.</li> <li>Current ground water migration is not under control.</li> </ul>
Are Necessary Institutional Controls in Place?
☐ All ☑ Some ☐ None  Additional institutional controls need to be implemented
Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☐ Yes ⊠ No
Has the Site Been Put into Reuse?
☐ Yes ⊠ No

#### Sitewide Protectiveness Statement

Protectiveness Determination: Not Protective Addendum Due Date (if applicable):

N/A

#### Protectiveness Statement:

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented. Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

#### 1.0 Introduction

The purpose of a FYR is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The EPA prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP. The Code of Federal Regulations (CFR) states, in 40 CFR §300.430(f)(4)(ii):

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The South Carolina Department of Health and Environmental Control (SCDHEC) conducted the FYR and prepared this report regarding the remedy implemented at the Helena Chemical Company Landfill Superfund site in Fairfax, Allendale County, South Carolina. The SCDHEC

personnel conducted this review from March 2014 to June 2014. The EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site.

This is the third FYR for the Site. The triggering action for this review is the signature date of the second FYR. The FYR is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This FYR Report addresses the entire Site.

# 2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Date	Event
prior to the mid-1960's	Agricultural Pesticide Production by Atlas Chemical Company
mid-1960's - 1971	Agricultural Pesticide Production by Blue Chemical Company
1971-1978	Agricultural Pesticide Production by HCC
1979	Pesticide Production ceased; retail location created by HCC
November 1980	Site Initially Investigated by South Carolina Department of Health and Environmental Control SCDHEC
December 1980	Initial Soil Samples collected from SCDHEC
July 1981	Site Discovery - SCDHEC issued NOV for waste disposal operation
October 1, 1981	Administrative Order of Consent for RI/FS
October 1981 - July 1982	Preliminary Assessment / Site Inspection Activities
September 14, 1982	Identification and Preliminary Assessment Report
March 29, 1985	Preliminary Site Inspection Report
August 8, 1985	Site Inspection Report
June 1987	Hazardous Ranking Score Complete
June 24, 1988	Proposal to NPL
March 31, 1989	RI/FS Negotiations
April 12, 1989	Administrative Order of Consent
February 21, 1990	Final Listing on NPL
December 31, 1992	Final Remedial Investigation Report
January 13, 1993	Feasibility Study
September 8, 1993	Record of Decision
September 22, 1993	Administrative records
May 25, 1994	RD/RA Negotiations
June 14, 1994	Unilateral Administrative Order
September 1, 1995	ROD Amendment (First Amendment)
April 30, 1997	Final Design Report
May 28, 1997	PRP RD
February 11, 1999	ROD Amendment (Second Amendment)
September 13, 1999	Preliminary Close-out Report
December 19, 2002	2002 Groundwater and Sediment Monitoring Report
March 1, 2004	2003 Groundwater and Sediment Monitoring Report
September 17, 2004	First Five-Year Review Report
March 1, 2005	2004 Groundwater and Sediment Monitoring Report

Date	Event		
March 1, 2006	2005 Groundwater and Sediment Monitoring Report		
April 3, 2007	2006 Groundwater and Sediment Monitoring Report		
March 14, 2008	2007 Groundwater and Sediment Monitoring Report		
March 12, 2009	2008 Groundwater and Sediment Monitoring Report		
September 17, 2009	Second Five-Year Review Report		
February 23, 2010	Field Sampling Plan and Quality Assurance Project Plan		
May 28, 2010	2009 Groundwater and Sediment Monitoring Report		
June 15, 2010	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site		
March 24, 2011	2010 Groundwater and Sediment Monitoring Report		
April 19, 2012	2011 Groundwater and Sediment Monitoring Report		
	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical		
July 23, 2012	Company Landfill Site, Revision 01		
August 24, 2012	Permit Request for Shallow and Deep Well Installation		
April 17, 2013	2012 Supplemental Activities & Annual Monitoring Report		

# 3.0 Background

# 3.1 Physical Characteristics

The Site, in Fairfax, South Carolina is located on 13.5 acres adjacent to Highway 321 in Allendale County, South Carolina (Figure 1). Located at the facility is a former landfill, which contains pesticide residues and other waste materials generated on-Site.

The former landfill occupies approximately four (4) acres on the northeast portion of the Site. A chain link security fence topped with barbed wire encircles the Site. A municipal water supply well that is utilized by a population of approximately 2,300 is located 200 feet west of the property. Three buildings exist on the Fairfax property, two warehouses and an office building (Figure 2).

The north warehouse, which was once utilized to house the liquid insecticide formulation operation, is currently used to store various pesticides, herbicides, and fertilizers, which are sold to farmers. There are several significant features of the liquid formulation building which were focal points of the investigation. Two 22,000 gallon above ground solvent tanks were once located near the north entrance to the "kettle room" in the former liquid formulation building. These tanks were present prior to Helena's occupancy of the property. Solvents used in the formulation process were delivered to the Site by rail car via a rail spur, which borders the Site to the east. The solvents were offloaded by pressurizing the tanker cars and pumping the solvents through product lines, which ran under the formulation building to the storage tanks. The solvent tanks are no longer present; however, the concrete slab on which the tank saddles rested still exists.

An additional warehouse formerly located at the Site, where powdered insecticides were formulated, has been demolished and disposed. A septic tank system that serviced the Site is located between the north liquid formulation building and the office.

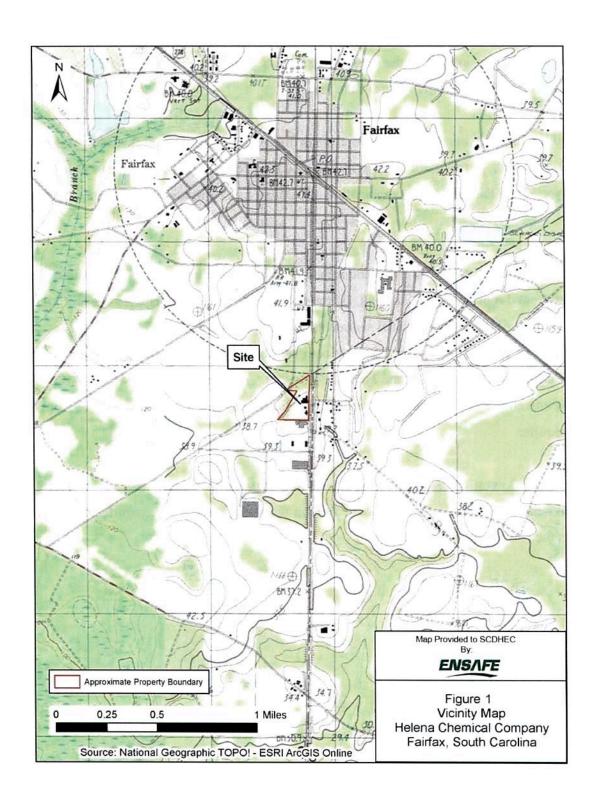
The local topography of the Fairfax area exhibits little relief (Figure 2). The Site property slopes slightly to the north. North of the property is a topographically low area that collects

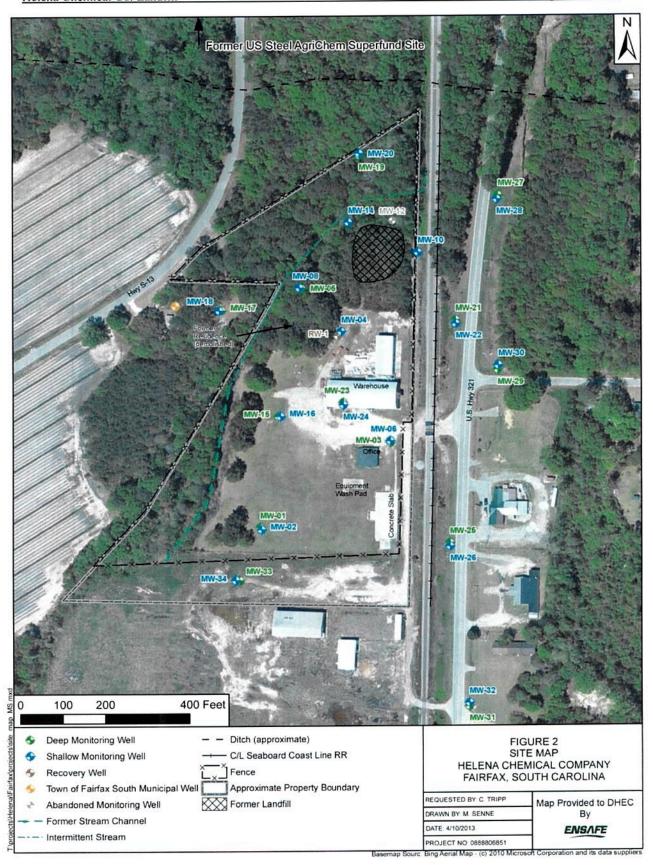
surface water during period of high rainfall. Additionally, surface water from the facility drains into a small ditch that parallels the property to the northwest. This ditch carries the water to Duck Creek, a tributary located northwest of the property, which in turn flows into the Coosawatchie River located to the west of the Fairfax property. The creek and the river are located within a three (3) mile radius of the Site.

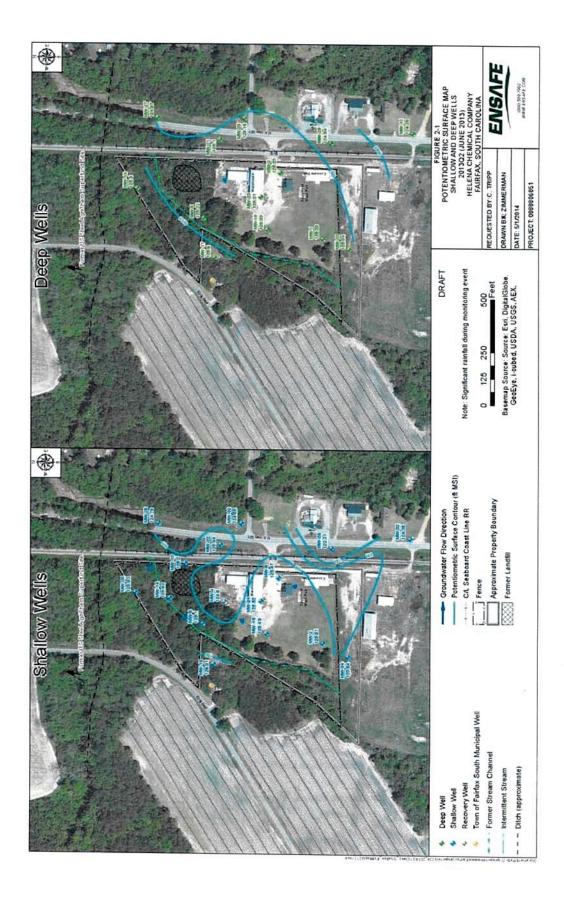
The facility property is bordered to the south by an abandoned manufacturing company, Corbett Plywood; to the north by heavily wooded undeveloped property, railroad tracks and U.S. Hwy 321 to the east, and a combination of cultivated and partially wooded property to the west.

Site-specific geological and stratigraphic information was developed during the installation of test borings and monitoring well boring. Three distinct stratigraphic units were observed in the upper 145 feet of the unconsolidated sediments encountered at the Site. Two aquifers occur at the Site. The uppermost aquifer (shallow aquifer) occurs within the sands of the Barnwell Group and the lower portion of the Duplin Formation. The deeper aquifer occurs within the lower Barnwell Group. No distinct confining unit separates the water table aquifer from the deeper aquifer

Groundwater flow at the Site is described as being seasonally variable. However, based on potentiometric data collected groundwater flow in the shallow and deeper aquifer is generally towards the southeast (Figure 2-1).







#### 3.2 Land and Resource Use

Several companies have owned and operated pesticide formulation facilities at the Site currently owned by HCC. Prior to the mid-1960s, the Site was owned by Atlas Chemical Company then from the mid-1960s until 1971 it was owned by Blue Chemical Company. Between the years 1971-1978, HCC used the Site for the formulation of both liquid and dry agricultural insecticides. HCC ceased formulation operations at the Site in 1979 and currently operates a retail facility that sells fertilizers, herbicides, pesticides and seed.

Drinking water at the Site and surrounding residential properties is provided by the City of Fairfax.

## 3.3 History of Contamination

As described above, several companies have owned and operated pesticide formulation facilities at the Site, currently owned and occupied by HCC. Chemicals that have been stored and/or formulated at the facility during its active life include dichlorodiphenyltrichloroethane (DDT), aldrin, toxaphene, disulfoton, dieldrin, chlordane, benzene hexachloride (BHC), ethoprop, methyl parathion and ethyl p-nitrophenyl thionobenzene-phosphonate (EPN). During the formulation process, these chemicals were mixed with carrying agents including diesel fuel, volatile organic chemicals and adsorbent materials.

### 3.4 Initial Response

The first regulatory actions taken at the Site occurred in November 1980, as a result of reports by a former employee of HCC and a newspaper report that a waste dump was being operated on the Site. The Site was investigated at that time by the SCDHEC. Numerous soil samples were collected and analyzed in December 1980. High levels of various pesticides, including aldrin, BHC isomers, chlordane, dieldrin, disulfoton, endrin and toxaphene were detected in these samples.

The SCDHEC issued a Notice of Violation to HCC in July 1981, for the operation of a waste disposal facility in violation of applicable South Carolina regulations. Administrative Order of Consent (AOC) No. 81-05-SW was issued on October 1, 1981.

In compliance with the terms of this Consent Order, HCC conducted investigations at the Site lasting from October 1981, to July 1982. The results of these studies indicated that surficial soils were heavily contaminated with pesticides, including those identified in the earlier sampling described above. Groundwater sampling for this investigation was contradictory. The positive results reported from the first sampling event were not confirmed. Surface water samples, taken from water standing in the wetland areas in the northern portion of the Site were found to be heavily contaminated with site-related pesticides.

HCC prepared a plan for site remediation which was submitted to the SCDHEC for review, and, under the terms of an amendment to Administrative Consent Order No. 81-05-SW, dated March 12, 1984, remediation efforts were conducted that consisted mainly of the removal of approximately 500 cubic yards of contaminated soils to a permitted hazardous waste landfill. In 1985, the EPA, in conjunction with the SCDHEC, conducted a Site Screening Investigation at the Site in order to prepare a Hazard Ranking System (HRS) package to determine whether the Site should be included on the National Priorities List (NPL). The HRS package was completed in June 1987, and the Site was proposed for listing in June 1988. The Site was finalized on the NPL in February 1990.

## 3.5 Basis for Taking Action

In April 1989, the EPA entered into an AOC with HCC to perform a remedial investigation. HCC completed the investigation in December 1992. Investigation results indicated that soil, surface water, and groundwater contaminant concentrations presented unacceptable risk to human health and the environment. The pathways included:

- Current and future dermal exposure and ingestion to on-site contaminated surface soils
- · Current and future direct contact with surface water
- Future ingestion of contaminated groundwater

### 4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with Applicable or Relevant and Appropriate Requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(f)(5)(i) of the NCP. The nine criteria include:

- 1. Overall Protectiveness of Human Health and the Environment
- 2. Compliance with ARARs
- 3. Long-Term Effectiveness and Permanence
- 4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment
- 5. Short-term Effectiveness
- 6. Implementability
- 7. Cost
- 8. State Acceptance
- 9. Community Acceptance

# 4.1 Remedy Selection

The EPA selected the remedy for the Site in the September 1993 Record of Decision (ROD). The ROD listed the following RAOs:

- The remedial action objective for contaminated groundwater is to restore the affected aquifer to a condition that renders it suitable for use as a potable water supply.
- The overall remedial action objective for the surface and subsurface soils is to remove and remediate contaminated soils to such a degree that both groundwater quality (in conjunction with ground-water extraction and treatment) and human health are protected.

 The remedial action objective for the fill and the contaminated sediments is to mitigate for the impacts that have resulted in these unacceptable levels of risk to environmental receptors.

The selected remedy, as stated in the ROD, included several major components and a contingency remedy:

# Source Control

Excavation of contaminated surface and subsurface soil, with verification sampling; treatment of the contaminated soils by means of hydrolytic/photolytic dechlorination and biological degradation; placement of the treated soils into on-site excavations. Site re-grading to prevent uncontrolled storm-water runoff into waters of the State or the United States.

### Groundwater

Extraction of contaminated groundwater from the surface (shallow) aquifer and treatment and discharge of the treated groundwater to a local Publicly Owned Treatment Works (POTW).

# Mitigation for adverse impacts to wetlands

Mitigation for adverse impacts in the wetlands to environmental receptors in accordance with regulatory guidelines established under the authority of Section 404 of the Clean Water Act.

# Site Monitoring

Annual sampling of groundwater and nearby public water supply to monitor the concentrations and movement of contaminants in affected and potentially affected aquifers.

<sup>&</sup>lt;sup>1</sup> Subsequent ROD amendments changed this treatment option.

#### **Contingency Remedy**

Low temperature thermal desorption (LTTD) is a contingency remedy for soil treatment, to be implemented should the chosen soil treatment technology prove incapable of achieving performance standards.

The 1993 ROD was amended in 1995 and again in 1999. Both amendments addressed the selected treatment technology and remedial alternative for the treatment of contaminated soils at the Site. The September 1, 1995 ROD amendment changed the treatment technology for contaminated soils from on-site hydrolytic/photolytic dechlorination, and bioremediation, to off-site incineration at a Resource Conservation and Recovery Act (RCRA)-permitted incinerator located in Clive, Utah. All other requirements of the September 1993, ROD remained unaffected.

The February 11, 1999 ROD amendment also addressed the treatment of contaminated soils at the Site. The modification of the remedy for contaminated soils included the excavation of approximately 6,500 cubic yards of pesticide contaminated waste and segregation of the waste into three categories consisting of demolition debris, soils with low and high contamination concentrations.

Soils with high concentrations of contaminants would be sent to the Sarnia hazardous waste landfill, regulated by the Ontario Ministry of Environment and Energy in Canada. Pre-excavation sampling indicated that 34 of the 46 waste samples exhibited contamination below the cutoff level for Sarnia. Helena then petitioned EPA to amend the 1995 ROD Amendment to allow for portions of the site waste to be sent to Sarnia, thereby reducing the overall remedy costs estimates from \$3,517,000 (incineration only) to \$2,361,900 (combination of incineration and landfill). All demolition debris would be sent to a RCRA regulated Subtitle C landfill.

The ROD required a remediation goal of 5 ppm of total pesticides for soils and sediments. The ROD selected cleanup goals for soils and sediments based on the potential for direct contact with and/or ingestion of the contaminated soil above health-

based levels and to eliminate soil as a potential source of groundwater contamination. The ROD identified sixteen contaminants of concern for the Site's groundwater (Table 2). The ROD based groundwater cleanup goals on the EPA National Primary Drinking Water Regulations (NPDWRs) Maximum Contaminant Levels (MCLs) for direct contact or ingestion.

Table 2: Groundwater Remedial Goals

Groundwater Remedial Goals			
Contaminant of Concern	ROD Established Remedial Goal (μg/l)*		
Volatile Organic Compound			
Benzene	5		
Inorganics	sant Thirt and y part but I study has become their		
Chromium	100		
Lead	15		
Pesticides	and the contract of the state o		
4,4'-DDT	0.1		
4,4'-DDD**	0.1		
4,4'-DDE***	0.1		
Aldrin	0.002		
Alpha-BHC	0.006		
Beta-BHC	0.02		
Chlordane	2		
Delta-BHC	0.006		
Dieldrin	0.002		
Endrin	2		
Gamma-BHC (Lindane)	0.2		
Heptachlor	0.4		
Toxaphene	3		

<sup>\*</sup>µg/L refers to micrograms per liter

<sup>\*</sup>DDD refers to Dichlorodiphenyldichloroethane

<sup>\*\*</sup>DDE refers to Dichlorodiphenyldichloroethylene

# 4.2 Remedy Implementation

In June 1994, EPA issued a Unilateral Administrative Order to HCC, which required HCC to conduct the Remedial Design and Remedial Actions prescribed by the ROD.

### Soil/Sediment Remedy

Since 1983, soil and part of the landfill has been removed from the Site during four separate actions. The March 1984 and April 1992 removals are discussed in Section 3.4, Initial Response.

The Remedial Design for the Soil/Sediment remedy began in 1995 and was completed in 1997 by the PRP with EPA oversight.

In the summer of 1995, approximately 700 cubic yards of soil were excavated from the Site and incinerated. Except for soil in and around the landfill, all soils exceeding the removal standard of 50 milligrams per kilogram (mg/kg) total pesticides as specified in the ROD, was excavated and shipped to Laidlaw Environmental Services' incinerator facility in Clive, Utah.

Excavation of the landfill occurred during the time frame of September to October 1998. The soil removal and off-site disposal occurred in conformance with the 1999 ROD amendment. Confirmation samples were collected prior to backfilling the excavation, to determine if the remediation goal of 50 mg/kg total pesticide concentrations had been attained. The confirmation sample concentrations ranged from 3.3 mg/kg to 42.7 mg/kg with an average of 12.1 mg/kg.

Remedial Action activities in the wetland area were conducted from September 14-16, 1998. The area north of the landfill was heavily vegetated. After the vegetation was cleared, the soil berm located in the wetland was easily distinguished from the surrounding wetland because it was approximately 75 feet long by 15 feet wide and up to 6 feet high. To disturb as little of the wetland as possible, the entire berm and 1 foot of material below it was removed. The concrete pad next to the north warehouse was first

covered with plastic sheeting so the material removed from the wetland could be stockpiled on top of it. A track hoe excavator was then used to excavate the soil berm and frontend loaders transported it from the north edge of the landfill to the concrete pad next to the north warehouse. The need to move the wetland material across the length of the landfill was the reason why the wetland area was excavated before the landfill.

A second low berm of soil near the northwest corner of the landfill was investigated after the first berm was removed. This berm was approximately 15 feet long by 5 feet wide by 2 feet high. Initial excavation uncovered numerous crushed and rusted metal drums. Continued excavation showed that the berm was attached to the landfill. EnSafe and USEPA discussed the northwest berm and decided to consider it part of the landfill, not the wetland, which changed the RAO for this area. Ultimately, much more soil was removed from the northwest corner of the landfill than the northwest berm of soil, so excavation of this berm is dealt with as if it was another part of the landfill. See Section 3 for further discussion of the berm in the landfill's northwest corner.

All wetland and landfill excavation activities were complete by October 1998.

#### **Groundwater Remediation**

The Remedial Design for the groundwater remediation system began in 1995 and was completed in 1997 by HCC with EPA oversight. During the April/May 1995 preliminary design investigation, the aquifer was tested to establish the nature of groundwater representative of full-scale extraction, and to obtain best estimates of hydraulic conductivity, transmissivity, and storativity of the shallow aquifer for use in extraction system design. A single recovery well, RW-1, was installed for the test. Various recovery wells scenarios were studied for implementation; however a single recovery well was determined to be sufficient.

The recovery well was determined to recover groundwater at an average rate of 40 gallons per minute (gpm).

The groundwater recovery system consists of one recovery well, RW-1, fitted with an electrical submersible pump. The system began operating in September 1999. No pretreatment of recovered groundwater occurs prior to being pumped and discharged to an on-site sanitary sewer manhole. The discharge requirements are regulated through an Industrial User Discharge Permit with the Town of Allendale. Water flows by gravity to a lift station, which is located approximately 200 feet to the northwest. An electronic control panel regulates the pump, pump cycle, and low-water-level sensor. The recovered groundwater is treated in the Town of Allendale's wastewater treatment plant under the terms of an industrial sewer user permit.

Routine water level measurements are used to record the actual radius of influence from the drawdown at the recovery well during start-up. Groundwater samples are collected and analyzed for contaminants of concern (COCs) annually, to determine remediation system progress. The expected time frame for significant restoration of the groundwater was 9 to 15 years from the time the remedial system began operating.

The Remedial Action was determined to be construction complete with the signing of the Preliminary Close-Out Report on September 13, 1999.

# 4.3 Operation and Maintenance

Fifteen years of site operation and maintenance (O&M) activities have been completed at the Site. O&M activities at the Site are conducted by EnSafe from Memphis, Tennessee on behalf of HCC. Groundwater and sediment samples are collected annually at the Site. In addition to annual groundwater and sediment monitoring, groundwater discharge samples are collected and analyzed quarterly as required by the Industrial User Discharge Permit.

The 2014 FYR site inspection revealed the need for some minor site maintenance. Damaged sections of the perimeter fence need to be repaired. The perimeter fence within the wooded and wetland areas need to be cleared of ice/wind damaged trees. The southern perimeter fence (running east to west) needs to be moved approximately 130

feet south to the property line. This will place MW-34 within the secured perimeter of the Site. The volunteer growth pines located on the former landfill area should be assessed for any potential impact to the Site.

This summary includes the annual costs for the operation and maintenance of the extraction/recovery well, which includes the drilling subcontractor and labor to remove and replace the pump and maintain the flow meter. Annual costs for the monitoring of groundwater wells, sediment in the wetlands, the municipal drinking water wells, along with all quarterly monitoring events of the recovery well are also included. Costs for the quarterly documentation and reporting requirements to the Town of Allendale under the Industrial User Discharge Permit, and for the annual data validation, documentation, and reporting requirements to the USEPA and SCDHEC are also calculated into the total.

Table 3: Annual Operation and Maintenance Costs (2009-2013)

Year	O & M Costs for Extraction & Recovery Well	Monitoring and Reporting Costs
2009	\$4,700	\$61,200
2010	\$3,500	\$113,000
2011	\$5,050	\$52,200
2012	\$21,710	\$186,290
2013	\$13,550	\$130,500

Significant deviations in the range of costs are detailed below:

#### 2010

Monitoring and reporting costs increased due to the required preparation and production of a new Sampling and Analysis Plan and Quality Assurance Project Plan to address issues identified in the 2009 5-Year Review.

#### 2012

O&M costs increased due to purchase and installation of new pump and flow meter, and additional maintenance required for the flow meter.

Monitoring and reporting costs increased due to the installation and sampling of eight (8) new monitoring wells, and a water use survey conducted to address issues identified in the 2009 FYR.

### <u>2013</u>

O&M costs increased due to repair and replacement of the discharge pipe for the recovery well and additional maintenance required for the flow meter.

Monitoring and reporting costs increased due to the monitoring of eight (8) new monitoring wells and additional quarterly monitoring events during 2013.

Table 4 summarizes the O&M costs during the previous five years. O&M costs average approximately \$118,340 per year. O&M costs were estimated during the Feasibility Study for O&M of the groundwater remediation and the on-site landfill area. Current O&M costs at the Site are below cost estimates developed during the Feasibility Study.

# 5.0 Progress Since the Last Five-Year Review

In September 2009, the second Five-Year Review's protectiveness statement read as follows:

"The remedy at the HCC Landfill protects human health and the environment in the short-term because there are no exposure pathways. According to local authorities and nearby residents interviewed during this Five Year Review, drinking water is obtained from the Town of Fairfax, and no drinking water wells are located nearby. The vapor intrusion pathway was evaluated however a thorough evaluation of specific data indicated that the vapor intrusion pathway is not a complete pathway at this time. The direct exposure soil pathway has been addressed through excavation and removal of contaminated soils.

However, in order for the remedy to be protective in the long-term, the following actions need to be taken. Additional recovery wells need to be installed to fully capture the contaminated groundwater plume. Additional monitoring wells need to be installed to determine the extent of groundwater contamination. Sampling of the nearby Fairfax Municipal well should be continued. Sampling for metals in groundwater at the Site should be continued. The ROD needs to be modified through either an Explanation of Significant Difference (ESD) or ROD Amendment to require Institutional Controls on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated. The current Restrictive Covenant needs to be modified to correct inaccurate information and to include the entire Site.

The 2009 FYR included eleven issues recommendations. This report summarizes each recommendation and its status below.

Table 4: Progress on Recommendations from 2009 FYR

Issue	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Additional wells should be installed and sampled to define the extent of groundwater contamination.	НСС	03/17/2010	Additional wells were installed	October 2012
Based upon the information collected in response to the above issue; additional recovery wells may need to be installed at the Site or the existing system may need to be upgraded in an effort to capture the migrating groundwater contamination.	НСС	09/17/2010	TBD – Design Conceptual Site Model	In Progress
Considering the extent of groundwater contamination is unknown at this time, a water use survey should be performed within a 1-mile radius of the Site.	НСС	03/17/2010	Water Use Survey Conducted.	2012
The ROD needs to be modified through either an ESD or ROD Amendment to require Institutional Controls.	EPA	09/17/2010	ROD Amendment or ESD.	In Progress
Institutional controls should be reviewed and revised for the Site as necessary.	НСС	09/17/2010	Place a restrictive covenant on the Site property.	In Progress
Any surrounding impacted properties should have ICs in the form of a restrictive covenant placed on the deed to the impacted property.	НСС	09/17/2010	Place restrictive covenants on properties impacted by Site related contaminants.	In Progress
The nearby Fairfax Municipal well should be sampled annually for Site related COCs and analyzed utilizing a low pesticide concentration method.	НСС	2009 Annual Sampling Event	Fairfax Municipal well analyzed annually utilizing CLP low pesticide concentration methods.	Complete/Ongoing
Sampling for metals in groundwater at the Site should resume.	НСС	2009 Annual Sampling Event	Sampling for metals in groundwater has resumed.	Complete/Ongoing
A QAPP* should be developed for the Site.	HCC	11/01/2009	QAPP was completed in 2010.	February 23, 2010
Evaluate increasing contaminant concentrations in sediment.	НСС	2009 Annual Sampling Event	Additional sediment samples collected to delineate the extent of sediment contamination.	In Progress/Ongoing
Update Site Repository information or location.	EPA	03/17/2010	Site Repository re- established and updated.	2012

<sup>\*&</sup>quot;QAPP" refers to Quality Assurance Project Plan

## 6.0 Five-Year Review Process

# **6.1** Administrative Components

EPA Region 4 initiated the FYR in March 2014 and scheduled its completion for June 2014. The SCDHEC review team, led by Timothy Kadar, also included the Remedial Project Manager Kayse Jarman, Environmental Health Manager Robert Cole, and the Community Liaison Donna Moye. The review schedule established consisted of the following activities:

- Community Notification
- Site Inspection (EPA, HCC and SCDHEC)
- Community Interviews
- · Document Review
- · Data Review
- FYR Report Development and Review

# 6.2 Community Involvement

In March 2014, the SCDHEC placed a public notice in the *Allendale Sun* newspaper announcing the commencement of the FYR process for the Site. The notice requested community participation in the FYR process and provided contact information for RPM Candice Teichert and Community Liason Donna Moye. The press notice is available in Appendix B. No contact was made to EPA as a result of the advertisement.

The FYR report will be made available to the public once it has been issued. Copies of this document will be placed in the designated public repository: Fairfax City Hall, 635 Allendale Fairfax Highway, Fairfax, South Carolina.

On March 25, 2014, the SCDHEC Community Liason Donna Moye and SCDHEC RPM Charles Williams interviewed several residents that live near the Site. A summary of the interviews are provided in Section 6.6.

### 6.3 Document Review

This FYR included a review of relevant, site-related documents including the ROD, remedial action reports, and recent monitoring data. Appendix A includes a complete list of the documents reviewed.

### **ARARs Review**

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are more stringent than federal requirements may be applicable or relevant and appropriate. To-Be-Considered criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, To-Be-Considered criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or discharged to, the ambient environment. Examples of chemical-specific ARARs include maximum contaminant levels (MCLs) under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

#### Ground Water ARARs

According to the Site's 1993 ROD, the ground water ARARs are the National Primary Drinking Water Standards (40 CFR Part 141). The ROD also identified South Carolina chemical-specific ground water ARARs for the Site. However, the State of South Carolina adopted the federal drinking water standards in their entirety. As shown in Table 5, drinking water standards have not changed.

Table 5: Summary of Groundwater ARAR Changes

Contaminants of Concern	1993 ROD ARARs (μg/L)	Current ARARs (µg/L)	ARAR Change
Aldrin	0.002	0.002	No
Alpha-BHC	0.006	0.006	No
Beta-BHC	0.02	0.02	No
Dieldrin	0.002	0.002	No
DDE	0.1	0.1	No

South Carolina Drinking Water MCLs are found at http://www.scdhec.gov/environment/water/regs/r61-58.pdf To be considered Cleanup Goal

Federal Maximum Contaminant Level

Secondary Drinking Water Standards

### Soil and Sediment ARARs

Changes in toxicity and other contaminant characteristics were evaluated for soil and sediment data for this FYR. Both carcinogenic and non-carcinogenic values were reevaluated based on the new or revised toxicity values and they are still within EPA's acceptable risk range.

Table 6: Summary of Soil and Sediment ARAR Changes

		1993 ROD values	alues	2014 5 Year Review values	values		Has the Value
Contaminant	CAS Number	Slope Factor (SF)	RfD	2014 Slope Factor (SF)	2014 RfD	Date Last Revised	Changed Since
		(mg/kg/day) <sup>-1</sup>	(mg/kg/day)	(mg/kg/day) <sup>-1</sup>	(mg/kg/day)		ille 1999 ivoid
Chlordane	12789-03-6	1.3	9000000	0.35	0.0005	2/7/1998	Yes
Endrin	72-20-8	NA	0.0003	NA	0.0003	4/1/1991	No
Heptachlor	76-44-8	4.5	0.0005	4.5	0.0005	3/1/1991	°N
Heptachlor Epoxide	1024-57-3	9.1	0.000013	9.1	0.000013	3/1/1991	No
Disulfoton	298-04-4	NA	0.00004	NA	0.00004	3/1/1988	No
Benzene	71-43-2	0.029	NA	.015055	0.004	4/17/2003	Yes
Aldrin	309-00-2	17	0.00003	0.00003	17	3/1/1988	N <sub>o</sub>
α-BHC (α-HCH)	319-84-6	6.3	VA	6.3	NA	No Data	No
β-ВНС (β-НСН)	319-85-7	1.8	VA	1.8	NA	No Data	No
gamma-BHC (Lindane)	6-68-85	1.3	0.0003	NA	0.0003	3/1/1988	°N
delta-BHC (delta-HCH)	319-86-8	NA	NA	NA	Ϋ́Ζ	No Data	°Z
Dieldrin	60-57-1	91	0.00005	16	0.00005	0661/1/6	No
Endosulfan	115-29-7	NA	0.00005	NA	900.0	10/1/1994	Yes
DDD	72-54-8	0.24	NA	0.24	NA	No Data	°Z
DDE	72-55-9	0.34	VV	0.34	NA	No Data	°N
DDT	50-29-3	0.34	0.0005	0.34	0.0005	2/1/1996	N <sub>o</sub>
Toxaphene	8001-35-2	1.1	NA		VV	No Data	oN
TBPT		NA	ΝΑ	NA	NA	No Data	oN
Methoxychlor	72-43-5	NA	0.005	NA	0.005	1661/1/8	No
Chlorobenzilate	510-15-6	NA	0.02	NA	0.02	12/1/1989	oN.
Chromium [Chromium (III)]	16065-83-1	NA	-	NA	1.5	8661/8/6	Yes
Lead	7439-92-1	NA	0.0014	NA	NA	7/8/2004	Yes

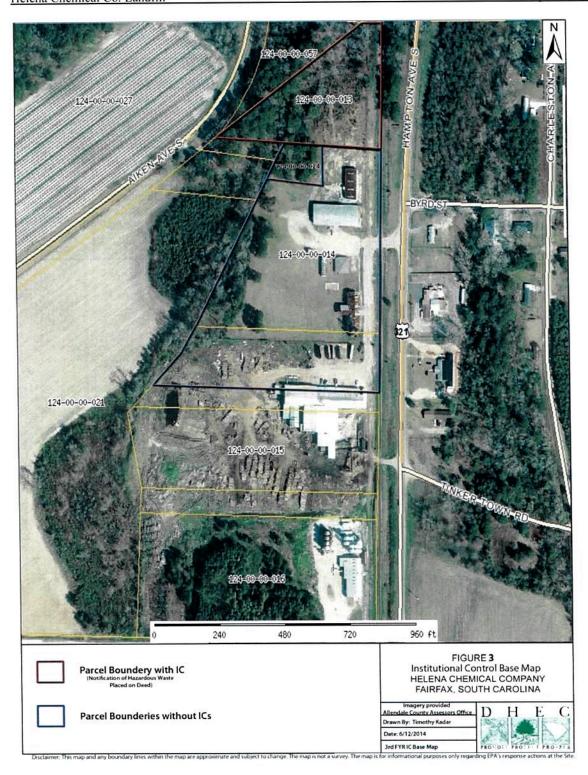
# Institutional Control Review

In March 2014, DHEC staff visited the Allendale County Public Records Office and found no recorded institutional controls for Site properties. On April 30, 2014, HCC recorded a Notice of Hazardous Waste on the 3.5 acre parcel (parcel 124-00-00-013) that contained the former landfill. Allendale County identifies the following parcels within the Site property boundary: 124-00-00-013, 124-00-00-014, 124-00-00-024 (Figure 3).

The 1993 ROD, and both the 1995 and 1999 Amendments to the ROD did not require institutional controls. Ground water contamination remains on-site and has migrated offsite; therefore, ground water use restrictions should be implemented on any impacted properties.

**Table 7: IC Summary Table** 

Media	ICs Needed	ICs Called for in the Decision	Impacted Parcel(s)	IC Objective	Instrument in	Notes
Ground Water	Yes	<b>Documents</b> No	Site and unknown surrounding parcels	Restrict installation of groundwater wells.	Notice of Hazardous Waste placed on deed for Parcel 124-00- 00-013	Parcel 124-00- 00-014, 124- 00-00-024, and unknown surrounding parcels still need ICs



### 6.4 Data Review

Per the ROD, groundwater is monitored annually in 12 shallow wells that are screened between 15 and 25 feet below ground surface (bgs) and in nine deep wells that are screened between 90 and 100 feet bgs. In 2012, four shallow and four deep supplemental wells were installed and incorporated into the monitoring system. The objectives of the monitoring system are to monitor mass contaminate removal and to evaluate plume degradation over time in the shallow aquifer and to monitor contaminant trends and evaluate plume degradation over time in the deep aquifer. Groundwater remediation standards are listed in Table 2 and documented in the 1993 ROD. Groundwater shall be extracted until the remediation goals are obtained.

All groundwater samples that are collected from both the shallow and deep aquifers are analyzed for the COCs identified in Table 5. Groundwater samples that are collected from monitoring wells MW-3, MW-4 and MW-23 are additionally analyzed for volatile organic compounds (VOCs).

Extracted groundwater is discharged directly to the POTW, per an Industrial User Permit with the town of Allendale in accordance with the town's Sewer Use Ordinance and Pretreatment Regulations. Samples are collected quarterly and analyzed for a specified list of parameters, to verify that appropriate limits are achieved.

In addition to monitoring groundwater, pesticide concentrations in sediment within the wetland area are monitored in accordance with the Remedial Action Work Plan. Samples are collected annually from 10 locations. A five-point composite sample is collected from each grid and submitted for analysis (Figure 4). The objectives of the sampling include verifying compliance with the established remediation goal (RG) of 5 mg/kg total pesticide concentration cleanup criterion, monitoring natural degradation of pesticides and potential deposition of contaminated sediments within the wetland.

This section of the report includes an evaluation of current ground water conditions and considers potential options for enhancement of the ground water remedial action. The data are systematically evaluated as follows:

- · Sediment data
- · Shallow aquifer data from monitoring wells
- Deep aquifer data from monitoring wells
- · Overall recovery well system evaluation

#### Sediment

Five-point composite samples are collected annually from each grid as shown on Figure 4. The objectives of the sampling include verifying compliance with the established RG of 5 mg/kg total pesticide concentration cleanup criterion, monitoring natural degradation of pesticides and potential deposition of contaminated sediments within the wetland.

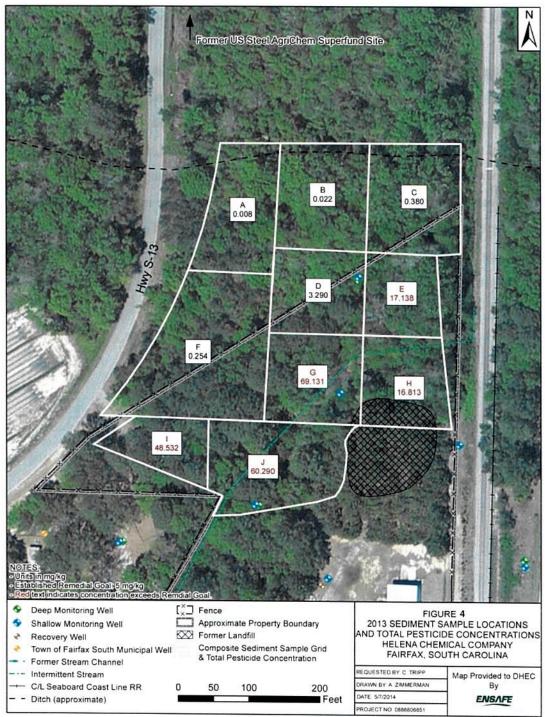
Five of the ten sample grid locations exhibited total pesticide concentrations above the RG of 5 mg/kg in 2013:

- Grid E = 17.138 mg/kg
- Grid G = 69.131 mg/kg (historical high)
- Grid H = 16.813 mg/kg
- Grid I = 48.532 mg/kg (historical high)
- Grid J = 60.290 mg/kg

Sediment sampling from 1999 to 2002 indicated all grids were below the RG for total pesticide concentrations. The first exceedences of the RG was detected in Grid E and Grid I in 2003. Grid E exhibited an increasing trend of total pesticides with a historical high in 2012 of 21.848 mg/kg. Grid I exhibited a fluctuating trend reaching a high in 2010. From 2012 to 2013 the total pesticide concentration again began an upward trend reaching a historical high of 48.532 mg/kg in 2013. Grid G has been exhibiting a fluctuating trend since 2004. The lowest concentration of total pesticides was 16.537 mg/kg in 2006. The highest concentration of total pesticides was in 2012 at 65.38 mg/kg and 2013 at 69.131 mg/kg. Grid H reached a historical high concentration of total pesticides in 2007. For the next three years, Grid H had a decreasing trend until 2011. The 2013 concentration of total pesticides at 16.813 mg/kg for Grid H is the highest

detection since 2007. After 2002, Grid J exhibited a fluctuating trend reaching a historical low of 5.031 mg/kg in 2008 and a historical high of 66.204 mg/kg in 2009.

Increasing sediment contaminant concentration data also indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially in the wetland area. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Migration of contamination off site in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways.



Service Layer Credits: Source: Esri. Digital Globe, GeoEye, Housed: USDA, USGS, AEX, Getmapping, Aerognol IGN, IGP: switstopo, and the GIS User Community

Table 8: Summary of Total Pesticide Concentrations in Sediment from 1999 to 2013.

						<b>J</b> 1	Sample Date	Jate						
Sample Grid	Dec-99	Feb-01	May-02	Aug-03	Sep-04	Nov-05	Dec- 06	Dec- 07	Dec-	Dec-	Dec-	Dec-	Dec-	Dec-
A	0.00	0.045	0.072	0.044	0.036	0.110	0.073	0.032	7500	000		11	77	12
В	900.0	0.031	0.048	0.054	0.00	0.072	0000	2000	0.027	0.019	0.336	0.035	0.04	0.008
ر	0.066	0770	000	2000	0.020	0.073	0.032	0.009	0.011	0.046	0.313	0.022	0.007	0.022
,	0.000	0.740	0.729	0.389	0.977	1.144	0.785	0.594	0.425	0.791	2.340	4 530	0.632	0 380
٥	0.301	0.836	0.262	0.220	1.574	3.315	0.999	0.744	0.609	1 290		000	1 550	0000
ш	0.560	3.671	4.706	7.240	14.600	1 933	5 073	0 004	1 716	1.230	× × ×	- 1	1.556	
ш	0.050	0 101	0 556	0 454	,0,0	0000	2,0,0	7.034	1./10	9.301	11.346	12.812	21.848	17.138
	0000	0.101	0.00	104.0	0.194	0.18/	0.095	0.119	0.081	0.211	0.575	0.603	6130	0.254
9	3.0/0	7.936	0.866	0.849	52.410	51.292	16 537	48 106	750 95	062.06	25 466	000	10.02	1.23.0
I	0 349	CN	2 1 20	3710	2 640	47 400	10000	10.100		20.070	33,466	21.38	65.38	69.131
	1000	200	0.1.0	0.173	2.040	17.480	14.363	45.137	10.468	5.563	7.800	14,705	14 277	16 813
	0.297	687.7	2.180	5.915	14.901	11.600	32.607	76 637	21 710	10 051	42 004	44 00	24.000	
7	0.128	0.238	0.199	0.157	23 490	13 622	12 065	21 460	27.77	19.031	43.091	11.82	34.896	48.532
Average					20:10	13,022	13.303	71.400	5.031	66.204	25.719	5.318	48.195	60.290
Avelage								100						
concentration	0.484	1.210	1.276	1.550	11.185	10.076	8.453	15.193		6.816 13.324 13.113	12 113	7274 40 745	10 745	

**Notes:** ND

ND = Not detected
All concentrations are in mg/kg (milligrams per kilograms) **Bold and Italic Text Indicate a Historical High.**Yellow Highlight Indicates Value Exceeds Total Pesticides Remedial Goal (5 mg/kg)

#### Groundwater Data

## **Recovery Well Pumping Rates**

The recovery well pumping rate is measured by a dedicated flow meter. The average flow rate is approximately 30-40 gpm. Between 34,000 and 36,000 gallons of water is discharged daily to the POTW for treatment, which is well within the Site's permitted discharge limit of 70,000 gallons per day.

# **Monitoring Well Sampling Frequency**

All monitoring wells at the Site are sampled quarterly as recommended in the Remedial Action Work Plan (1997).

No pesticides were detected in groundwater collected from the town of Fairfax's south municipal well and private residential wells located approximately 0.25 and 0.5 miles downgradient to the south of the Site's property line.

Ten pesticides have historically exceeded their respective RGs in Site monitoring wells: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, alpha-, beta-, delta-, and gamma-BHC, dieldrin, and toxaphene. The highest concentrations of pesticides were reported at wells within the Site property boundary. Analytical results and groundwater flow direction suggest low concentration pesticides above RGs extend beyond the current shallow monitoring network to the upgradient north and west, and downgradient east and southeast. No significant variations in groundwater flow direction or pesticide concentrations were attributable to seasonal fluctuations.

Historically since 2003, the highest pesticide concentrations exceeding RGs were reported in 2008, 2010, 2013Q3, and 2014Q1 at monitoring wells MW-4 and MW-23, located within the Site property boundary. Based on historical analyte trends per well, concentrations of each pesticide above the RG have either decreased or were stable, with the exception of aldrin and toxaphene, which appear to have increased at six wells located in the vicinity of the former landfill, and on the northern upgradient property line. Historical total pesticide concentrations also suggest increased concentrations on the southeastern Site property line.

Benzene was not detected above the RG in 2013Q4. Historically, low-level concentrations of benzene were detected above the RG of 5 µg/L at deep well MW-3 in 2006 at 7.5 µg/L, 2010 at 6.5  $\mu$ g/L, and 2011 at 7.45  $\mu$ g/L.

Chromium and lead were not detected above their respective RGs in 2013Q4. Since 1999, chromium was reported above the RG of 100 μg/L at shallow well MW-24 in 1999 at 1400 μg/L and 2011 at 1600 µg/L, and estimated at deep well MW-23 in 1999 at 160 µg/L. Monitoring wells MW-23 and MW-24 are a nested well pair.

Since 1999, lead was only reported above the RG at shallow well MW-24 during the 1999 monitoring event, with a concentration of 46 µg/L.

Table 9: Number of Site Wells Exceeding the PRG

200000000000000000000000000000000000000						Number o	f Site We	lls Excee	ding the R	G				
Parameter Name	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013Q2	2013Q3	2013Q4	2014Q
Pesticides														
4,4'-DDD	0	0	1	0	2	3	2	1	0	0	2/0	0	1/0	1/0
4,4'-DDE	0	1	1	1	2	2	2	2	2	1/0	0	2/0	2/0	3/0
4,4'-DDT	0	0	2	0	2	2	1	0	0	0	1/0	1/0	1/0	2/0
Aldrin	9	4	2	4	3	5	9	2	2	3/1	3/2	9/2	4/0	4/0
alpha-BHC	10	10	9	5	7	8	7	6	8	7/2	7/2	8/2	9/2	8/2
beta-BHC	13	14	14	12	13	15	14	12	13	13/1	12/3	12/3	13/3	11/2
delta-BHC	8	8	7	5	5	7	7	6	8	6/1	8/1	7/0	7/1	5/0
Dieldrin	10	13	12	12	12	15	14	16	15	12/1	11/0	16/2	12/1	15/1
gamma-BHC (Lindane)	2	1	1	2	1	1	2	3	3	2/0	2/0	2/0	3/0	3/0
Toxaphene	1	2	2	4	1	0	0	3	7	5/1	4/0	4/0	3/0	4/0
olatile Organic Compoun	ds									-11	- 1	40	5/6	170
Benzene	0	0	0	1	0	0	0	1	1	0	0	0	0	0
letals														
Chromium	NA	NA	NA	NA	NA	NA	0	1	1	0	0	0	0	0

Notes:

RG = Remedial Goal NA = Not analyzed

Well count does not include duplicate samples.

2/3 indicates Historical well network/ Supplemental well network

Based on the groundwater data collected, the recovery system is not performing as intended and groundwater contamination has migrated off-site. In addition to the potential migration of groundwater beyond existing well locations, sediment data collected during 2003-20014 indicate an increasing trend above the RGs in several of the grid locations.

#### Soil

Soil remediation activities at the Site finished in 1993. No new soil data were collected during the past ten years.

# 6.5 Site Inspection

The site inspection was conducted on March 25, 2014. A tour of the Site was provided by Edward Brister from Helena Chemical, followed by an inspection of the Site. The inspection team consisted of the following personnel: Candice Teichert (EPA), Charles Williams (SCDHEC), Kayse Jarman (SCDHEC), Donna Moye (SCDHEC), Robert Cole (SCDHEC), and Timothy Kadar (SCDHEC).

A visual inspection of the extraction well, monitoring wells, former landfill area and wetland area was conducted. The groundwater treatment system and associated wells appeared to be in good condition and operational. The sanitary sewer discharge location for the groundwater pumping system was also observed and appeared to be in good condition. Additionally, visual inspection of the two nearby Faifax Municipal wells was also conducted.

#### 6.6 Interviews

On March 20, 2014, SCDHEC placed a public notice in the Allendale Sun newspaper announcing the commencement of the FYR process for the Site. The notice requested community participation in the FYR process and provided contact information for EPA RPM Candice Teichert and SCDHEC Community Liason Donna Moye. The public comment period closed on April 30, 2014. The public notice is available in Appendix B.

On March 25, 2014, SCDHEC Community Liason Donna Moye, SCDHEC RPM Charles Williams, and SCDHEC Region Staff Tim Pearson interviewed six residents during door-to-door visits on Charleston Avenue, Tinker Town Road, and Byrd Street. Copies of the public notice and EPA Fact Sheet - Superfund Today were left at an additional five homes where no one came to the door. A summary of the interviews is provided in Section 6.6.

A resident's daughter contacted RPM Candice Teichert by email on April 21, 2014 with concerns about how chemicals may have affected her father's health. Her father has been a resident of the

area for 70 years and has worked outdoors for most of that time. RPM Candice Teichert responded by email on April 22, 2014, indicating that cleanup of contaminated groundwater was ongoing and sediment contamination levels are being monitored. Contact information for additional questions was also given in the email, along with the link to the EPA website for more information about the Site. Attempts by RPM Candice Teichert and EPA Community Involvement Coordinator (CIC) Angela Miller to contact the daughter by phone to discuss her concerns were unsuccessful.

The FYR report will be made available for public review once it has been issued. Copies of this document will be placed in the designated public repository: Fairfax City Hall, 635 Allendale Fairfax Highway, Fairfax, South Carolina.

# 7.0 Remedy Evaluation

# 7.1 Question A: Is the remedy functioning as intended by the decision documents?

The review of the ground water data, documents, ARARs, risk assumptions, and the site inspection indicate the groundwater recovery remedy is not functioning as intended by the ROD. Groundwater data indicates the groundwater plume is undefined and may have extended beyond the perimeter wells. The Site continues to be enclosed by a chain-link fence to restrict access to the Site. Although the ROD did not require ICs, Ed Brister from Helena Chemical was contacted during the FYR, regarding the status of a restrictive covenant on the Site property. On April 30, 2014, HCC filed a restrictive covenant in the form of a Notice of Hazardous Waste on parcel 124-00-00-013, with the State of South Carolina, County of Allendale. Upon further review, EPA has discovered that restrictive covenants should be placed on additional parcels encompassing the HCC Landfill Site, parcel 124-00-00-014 and 124-00-00-024. ICs should also be placed on adjacent properties that have been impacted by the migration of contaminated groundwater. The ICs are to ensure that future users do not come in contact with contaminated Additionally, increasing sediment contaminant concentration data indicates groundwater. potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially around the wetland area. The increasing contamination in the wetland represents a new exposure pathway.

# 7.2 Question B. Are the exposure assumptions, toxicity data, clean up levels and RAOs used at the time of remedy selection still valid?

ARARs used at the time of the remedy selection are still valid. The ground water ARARs have not changed for the COCs since the 1993 ROD.

# 7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

# 7.4 Technical Assessment Summary

The remedy at the HCC Landfill is not functioning as intended. Groundwater data indicates the groundwater plume is undefined and has extended beyond the perimeter wells.

Increasing sediment contaminant concentration data indicates potential source material may remain onsite, and could potentially be contributing to the increasing Contaminants of Concern (COC) concentrations in the shallow aquifer. Additionally, the extent of the pesticide contamination in soils has increased, especially around the wetland area. It was assumed that contamination measured in the surface water and sediments in the RI would diminish once the remedy was implemented. The increasing contamination in the wetland represents a new exposure pathway. Migration of contamination off site in surface water or leaching of contamination to groundwater should also be considered as new or expanding exposure pathways.

Additional restrictive covenants should be placed on parcel 124-00-00-014, 124-00-00-024 and any properties that have been impacted by the migration of contaminated groundwater.

# 8.0 Issues

Following 15 years of monitoring and treatment, the remedy is not performing as intended in the ROD. Groundwater data indicates that contamination located in both the shallow and deep aquifers has migrated beyond perimeter wells and potentially off-site. Recent sediment samples collected indicate an increasing trend in contaminant concentration and may be contributing to the increasing groundwater contaminant concentrations. The ROD did not require ICs, however groundwater contamination is present at the Site and has potentially migrated off-site.

# 9.0 Recommendations and Follow-up Actions

Table 10 provides recommendations to address the current issues at the Helena Chemical Co. Landfill Site.

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> Third Five-Year Review Helena Chemical Co. Landfill

Table 10: Recommendations to Address Current Issues at the HCC Landfill Site

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes	s? (Yes
					Current	Future
Extent of groundwater plume is not adequately delineated.	Install additional groundwater wells to adequately define the extent of the contaminated groundwater	нсс	EPA	3/1/2015	YES	YES
The current groundwater recovery system is not fully capturing the contaminated groundwater plume.	Additional recovery wells need to be installed or the current groundwater recovery system needs to be improved to fully capture the contaminated	нсс	EPA	6/1/2015	ON	YES
There are no institutional controls in place to prevent access to contaminated ground water.	Institutional controls should be implemented on parcel 124-00-00-014 and all other parcels affected by the migration of contaminated groundwater.	нсс	EPA	3/1/2015	YES	YES
Chromium speciation in groundwater needs to be performed to determine the percent of Cr+6.	Chromium speciation should be performed on 20% of the samples to provide information that can be used to determine the potential percentages of Cr+6 in the total chromium results.	НСС	EPA	6/1/2015	ON	YES

YES	YES
YES	ON
6/1/2015	6/1/2015
EPA	EPA
НСС	нсс
Additional risk assessment work should be conducted to incorporate the wider set of receptors including aquatic-dependent wildlife and carnivorous wildlife, as was originally proposed. The contamination in the wetland has increased in magnitude and extent. The current ecological risks at the site exceed the degree of risks understood at the time the wetland mitigation remedy was selected. The increasing concentrations of pesticides in the wetland represent a new exposure pathway.  Recommended inclusion of an assessment endpoint to protect the soil invertebrate community.	The cleanup goal for wetland soils should be revised to create separate goals for individual pesticides using updated toxicity values and exposure assumptions.
Ecological risk assessment data needs to be updated.	Toxicity data needs to be updated

\*"TBD" refers to To Be Decided

## 10.0 Protectiveness Statement

At this time, the remedy at the HCC Landfill is not protective of human health and the environment because of the increasing soil contaminant concentrations in the wetland area. Additionally, the migration of contamination offsite in surface water or leaching of contamination to groundwater should be considered as new or expanding exposure pathways. Contaminated groundwater migration is not under control and institutional controls (ICs) have not been implemented.

Contaminated sediment and surface water in the wetland area should be delineated and remediated. Additional monitoring wells need to be installed to determine the extent of groundwater contamination and additional recovery wells may need to be installed to fully capture the contaminated groundwater plume. Institutional Controls governing groundwater should be implemented on the Site property as well as on any adjacent properties onto which the contaminated groundwater plume has migrated.

# 11.0 Next Review

Five-Year Reviews are to be conducted at this Site until contaminant levels are below the cleanup goals established by EPA in Table 9.2 of the ROD (i.e., drinking water standards for identified COCs). Because Site contaminant levels remain above cleanup levels, the next Five-Year Review will be completed within five years of the date of this report. The due date for the next Five Year Review will be in September 2019.

# Appendix A: List of Documents Reviewed

Date	Document
April 12, 1989	Administrative Order of Consent
February 21, 1990	NPL Site Narrative for Helena Chemical Company Landfill, Helena Chemical Company Landfill, Fairfax, South Carolina.
September 9, 1991	Preliminary Health Assessment Report: Helena Chemical Company Landfill
December 31, 1992	Final Remedial Investigation Report: Helena Chemical Company Landfill
January 13, 1993	Feasibility Study: Helena Chemical Company Landfill
September 8, 1993	EPA Superfund Record of Decision: Helena Chemical Company Landfill
September 1, 1995	EPA Superfund Record of Decision: Helena Chemical Company Landfill (First Amendment)
February 5, 1997	Ecological Risk Assessment: Helena Chemical Company Landfill
April 30, 1997	Final Design Report: Helena Chemical Company Landfill
February 11, 1999	ROD Amendment (Second Amendment)
July 21, 1999	Landfill and Wetland Remedial Action Report
September 17, 2004	First Five-Year Review Report: Helena Chemical Company Landfill
September 17, 2009	Second Five-Year Review Report: Helena Chemical Company Landfill
February 23, 2010	Field Sampling Plan and Quality Assurance Project Plan: Helena Chemical Company Landfill
May 28, 2010	2009 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
June 15, 2010	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site
March 24, 2011	2010 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
April 19, 2012	2011 Groundwater and Sediment Monitoring Report: Helena Chemical Company Landfill
July 23, 2012	Second Five Year Review: Work Plan in Response to EPA Recommendations to Address Current Issues at the Helena Chemical Company Landfill Site, Revision 01
April 17, 2013	2012 Supplemental Activities & Annual Monitoring Report: Helena Chemical Company Landfill
May 28, 2014	2013 Quarterly & Annual Monitoring Report & First Quarter 2014 Report: Helena Chemical Company Landfill

# Appendix B: Press Notice

# **Public Notice**

# Helena Chemical Company Landfill Fairfax, South Carolina

The U.S. Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (DHEC) are conducting a 5-year review of the Helena Chemical Company Landfill site in Allendale County. This is a federal Superfund site with ongoing cleanup activities. The purpose of the review is to evaluate remedial activities of the past 5 years and make sure that the cleanup continues to protect human health and the environment. During the review, DHEC will conduct interviews with local residents, officials, and others who are familiar with the site. We value input about site conditions and want to hear any concerns of the local community. You are encouraged to participate in the review by contacting us with your comments or questions through April 30, 2014.

The 5-year review process is expected to be complete in fall 2014, at which time a report will be written on our findings. Comments about the site will be summarized in the report. The report will be available on EPA's website and at Fairfax City Hall in Fairfax. For more information about this site, please visit:

http://www.epa.gov/region4/superfund/sites/npl/southcarolina/helchemsc.html.

For comments, questions, or to participate in an interview, please contact:

**Community Involvement**: Donna Moye, DHEC Community Liaison, at (803) 898-1382, or by e-mail at <a href="mailto:moyedd@dhec.sc.gov">moyedd@dhec.sc.gov</a>.

**Technical Comments**: Candice Teichert, EPA Project Manager, at (404) 562-8821, or by e-mail at teichert.candice@epa.gov.

Please share this with others you know who might be interested.



# Appendix C: Interview Forms

Interview Form for Five-Year Review

Site Name: Helena Chemical Company Landfill

Interviewer's Name: Timothy Kadar Affiliation: SCDHEC

Interviewee's Name: Candice Teichert, Project Manager Affiliation: EPA, SRSEB

Contact Information: U.S. EPA Region 4

61 Forsyth Street Atlanta, GA 30303

Teichert.Candice@epa.gov

P: 404-562-8821

Type of Interview: Email Date: April 2, 2014

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

Additional contamination at the Site needs to be characterized.

2. What is your assessment of the current performance of the remedy in place at the Site?

The current remedy needs to be optimized and additional contamination needs to be characterized.

- 3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? No
- 4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. No
- 5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No
- 6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

The institutional controls currently implemented on the PRP owned property need to be amended.

- 7. Are you aware of any changes in projected land use(s) at the Site? No
- 8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

The groundwater remedy needs to be optimized and additional contamination needs to be characterized.

Site Name: Helena Chemical Company Landfill

Interviewer's Name: Timothy Kadar Affiliation: SCDHEC Interviewee's Name: Kayse Jarman, Project Manager Affiliation: SCDHEC

Contact Information: 2600 Bull Street

Columbia, SC 29201 jarmankb@dhec.sc.gov P: 803.898.0832

Type of Interview: Email Date: May 6, 2014

- 1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? The pump and treat system needs to be optimized and the sediment in the wetlands area needs to be investigated and addressed. There have been no maintenance issues since the last 5 Year Review. Reuse activities have not been discussed.
- 2. What is your assessment of the current performance of the remedy in place at the Site? The remedy needs to be optimized in several ways concerning the groundwater and sediment contamination. A capture zone analysis should be conducted for the groundwater recovery system to verify whether capture of the contaminated groundwater is being achieved. If capture is not being achieved, another recovery well should be installed. The source of the continued sediment contamination should be investigated and addressed. The sediment with elevated levels of contaminates should be remediated.
- Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? No
- 4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. Several site visits have been conducted to observe sampling methodology used at the site.
- 5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No
- 6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? *Institutional controls need to be corrected and implemented at the site and any other property that is found to be impacted by the groundwater and/or sediment contamination.*
- 7. Are you aware of any changes in projected land use(s) at the Site? No
- 8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? Although optimization needs to be implemented, the current remedy is working as designed.

Site Name: Helena Chemical Company Landfill

Interviewer's Name: Timothy Kadar Affiliation: SCDHEC Interviewee's Name: Greg Temple, Project Manager Affiliation: EnSafe

Contact Information: 5724 Summer Trees Drive

Memphis, TN 38134 gtemple@ensafe.com P: 901.372.7962

Type of Interview: In person during site inspection

Date: March 25, 2014

- 1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? The pump and treat system is operating as designed. Pesticides in wetlands are continue to exceed RGs in half of the grids (5 out of 10) indicating a possible upgradient influence. No maintenance issues other than routine service during the past five years.
- 2. What is your assessment of the current performance of the remedy in place at the Site? The remedy is operating as designed.
- 3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? No
- 4. What is the frequency of Operation and Maintenance activities and site inspections? To your knowledge, has the maintenance been implemented at the site? Groundwater at the Site is sampled quarterly. Sediments are sampled annually. The results are compiled in an annual report submitted to the EPA and SCDHEC. Maintenance of the pump and treat system are carried out as needed.
- 5. Are you aware of any changes in projected land use(s) at the Site? No
- 6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? The town of Fairfax's north water supply well is located about 0.7 miles upgradient of the site. We would like to remove it from the sampling schedule.

Site Name: Helena Chemical Company Landfill

Interviewer's Name: Timothy Kadar Affiliation: SCDHEC

Interviewee's Name: Rodney Stanley, Fire Chief Affiliation: Allendale County

Contact Information: 803.686.1080

Type of Interview: Phone Date: March 21, 2014

#### Interview Category: Local Government

 Are you aware of the environmental issues and/or cleanup activities at the Helena Chemical Co. Landfill site? Yes.

- 2. What are your views or concerns about site conditions, problems, or related concerns? None. However, Chief Stanley expressed concerns regarding the former Helena Chemical Company site located at 431 Frontage Road, Allendale, Allendale County, SC. The site has been operating as a metal recycler including crushing cars (Don's Scrap Metal Recycling). The company has erected a metal fence obscuring the site from view. County officials aren't sure what is happening on site anymore.
- 3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *None. Residents have been complaining of gasoline odors at Don's Scrap Metal Recycling.*
- 4. What effect has this site had on the surrounding community? *None*.
- 5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No.
- 6. Are you aware of any changes in projected land use(s) at or near the Site? *None. Some industries are reopening near Don's Scrap Metal Recycling.*
- Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? None.

Site Name: Helena Chemical Company Landfill

Interviewer's Name: Timothy Kadar Affiliation: SCDHEC
Interviewee's Name: James Rice, Utilities Director Affiliation: Town of Fairfax

Contact Information: 803.632.3799

Type of Interview: In person

Date: March 25, 2014

#### Interview Category: Local Government

 Are you aware of the environmental issues and/or cleanup activities at the Helena Chemical Co. Landfill site? Yes.

- 2. What are your views or concerns about site conditions, problems, or related concerns? None.
- Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? None.
- 4. What effect has this site had on the surrounding community? None.
- 5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? No.
- 6. Are you aware of any changes in projected land use(s) at or near the Site? None.
- Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? None.

# Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE	INSPECTION CHECKL	IST
I. SITE INF	ORMATION	
Site Name: Helena Chemical Company Landfill	Date of Inspection: March 25, 2014	4
Location and Region: Fairfax, Allendale County, SC, Region 4	EPA ID: SCD058753971	
Agency, Office or Company Leading the Five-Year Review: SCDHEC	Weather/Temperature: 55 and sun	nny
Remedy Includes: (Check all that apply)  Landfill cover/containment Access controls Institutional controls Ground water pump and treatment Surface water collection and treatment Other: Discharge into the town of Fairfax	☐ Monitored natural attenuation ☐ Ground water containment ☐ Vertical barrier walls	
Attachments:	☐ Site map attached	
II. INTERVIEWS	(check all that apply)	
1. O&M Site Manager Greg Temple Name  Interviewed  ☐ at site ☐ at office ☐ by phone P Problems, suggestions ☐ Report attached: Appendix		03/25/2014 Date
2. O&M Staff  Name  Interviewed  at site at office by phone I Problems/suggestions Report attached:	Title	mm/dd/yyyy Date

3.	response of	ulatory Authoriti ffice, police depart deeds, or other ci	tment, office of	f public :	health or e	environmental	al offices, emerg health, zoning	gency office,
	Contact	A Region 4 Candice Teichart Name		Remed Project Manag	<u>t</u>	04/02/2014 Date	(404) 562-88 Phone No.	321
	Problems/si	uggestions 🗌 Re	port attached: A		x C includ	les interview f	orms for FYR	
	Agency SC Contact	<u>CDHEC</u> Kayse Jarman			onmental	05/06/2014	(803) 898-08	332
				Engine Title		Date	Phone No.	77
	Problems/si	uggestions  Re	port attached: A	Appendi	x C includ	les interview f	orms for FYR	
		re Department of A Rodney Stanley	Allendale Coun	ity Fire Cl	hiof	3/21/2014	(902) 594 24	.07
		Name		Title	99800 <del>-1</del> 8	3/21/2014 Date	(803) 584-25 Phone No.	<u> </u>
	Problems/si	uggestions 🗌 Re	port attached: A	Appendi	x C includ	les interview f	orms for FYR	
		wn of Fairfax James Rice		T Telliel.		02/25/2014	(002) (22 2	100
		Name		<u>Utilitie</u> <u>Directo</u>		03/25/2014 Date	(803) 632-37 Phone No.	799
	Problems/s	uggestions 🗌 Re	port attached: A	Title Appendi	x C includ	les interview f	orms for FYR	
	Agency							
	Contact	Name		Title		Date		
		uggestions  Re	port attached:_			Date	Phone No.	
4.	Other Inte	erviews (optional)	Report atta	ached:				
	The second of the second of	ON-SITE DOCUM	MENTS AND	RECO	RDS VER	IFIED (chec	k all that apply)	
1.	O&M Do		1-000 N 804					20
	⊠ O&M 1		Readily ava			Up to date		N/A
	530.00	lt drawings	Readily ava			Up to date		N/A
		enance logs	Readily ava	ailable		☑ Up to date		N/A
25	Remarks:							
2.		ific Health and S	7//			y available	Up to date	□ N/A
		gency plan/emerg		74 H	A STATE OF THE STA	y available	Up to date	□ N/A
	Remarks: <u>available a</u>	EnSafe was condu and current.	acting a samplin	ng event	t during ou	ır site inspecti	on. All docume	ents were

3.	O&M and OSHA Training Records	Readily available	Up to date	□ N/A
	Remarks:			
4.	Permits and Service Agreements			
	☐ Air discharge permit	Readily available	Up to date	⊠ N/A
	☐ Effluent discharge	Readily available	Up to date	⊠ N/A
		Readily available	Up to date	□ N/A
	Other permits: NPDES	Readily available	□ Up to date	□ N/A
	Remarks:			
5.	Gas Generation Records	Readily available	Up to date	⊠ N/A
	Remarks:			
6.	Settlement Monument Records	Readily available	Up to date	⊠ N/A
	Remarks:			
7.	Ground Water Monitoring Records	Readily available	Up to date	□ N/A
	Remarks:		0.00 NAN	
8.	Leachate Extraction Records	Readily available	Up to date	⊠ N/A
	Remarks:			
9.	Discharge Compliance Records			
	Air Readily available	e	$\boxtimes$ N	I/A
	Water (effluent)	e 🛛 Up to date	□N	I/A
	Remarks:			
10.	Daily Access/Security Logs	Readily available	Up to date	⊠ N/A
	Remarks:			
	IV. O&M	COSTS		
1.	O&M Organization			
	State in-house	Contractor for state		
	PRP in-house	Contractor for PRP		
	Federal facility in-house	Contractor for Federal	facility	

2.	O&M Cost Records					
	Readily available		Up to date			
	☐ Funding mechanis	m/agreement in place	□ Unavailable			
	Original O&M cost es	stimate: Brea	kdown attached			
		Total annual cost by y	ear for review period	l if available		
	From: mm/dd/yyyy	To: mm/dd/yyyy		☐ Breakdown attached		
	Date	Date	Total cost			
	From: mm/dd/yyyy	To: mm/dd/yyyy		☐ Breakdown attached		
	Date	Date	Total cost			
	From: mm/dd/yyyy	To: mm/dd/yyyy	10 Total	☐ Breakdown attached		
	Date	Date	Total cost			
	From: mm/dd/yyyy	To: mm/dd/yyyy		☐ Breakdown attached		
	Date	Date	Total cost			
	From: mm/dd/yyyy	To: mm/dd/yyyy		☐ Breakdown attached		
	Date	Date	Total cost			
3.	Unanticipated or Un	usually High O&M Co	sts during Review I	Period		
	Describe costs and reasons:					
	V. ACCESS	AND INSTITUTIONA	L CONTROLS 🗵	Applicable N/A		
A. Fe	ncing					
1.	Fencing Damaged	☐ Location shown	n on site map	Gates secured N/A		
	Remarks: Ice storm da	amage to trees resulted i	n one tree laying on	the northeast section of the fence.		
		e many branches and tre ith access restricted to a		atening the integrity of the fence. Site		
	1,000		pair or locking gates	2		
B. Ot	ther Access Restrictions					
1.	Signs and Other Sec	urity Measures	☐ Location	shown on site map N/A		
	Remarks:					
C. In	stitutional Controls (IC	Cs)				

1.	Implementation and Enforcement		
	Site conditions imply ICs not properly implemented	Yes	☐ No ⊠ N/A
	Site conditions imply ICs not being fully enforced	Yes Yes	☐ No ⊠ N/A
	Type of monitoring (e.g., self-reporting, drive by):		
	Frequency:		
	Responsible party/agency:		
	Contact	mm/dd/yy	<u> </u>
	Name Title	Date	Phone no.
	Reporting is up to date	Yes	□ No □ N/A
	Reports are verified by the lead agency	☐ Yes	□ No □ N/A
	Specific requirements in deed or decision documents have been met	☐ Yes	□ No □ N/A
	Violations have been reported	☐ Yes	□ No □ N/A
	Other problems or suggestions:   Report attached		
	C COSCO MANAGEMENT STATE		
			_
2.	Adequacy ☐ ICs are adequate ☐ ICs are inac	dequate	□ N/A
	Remarks: There are no institutional controls currently in place on the S	Site.	To the second second
D. G	General		
1.	Vandalism/Trespassing    Location shown on site map    N	o vandalism	ı evident
	Remarks: Illegal dumping of household garbage takes place on the sou		
	southern fence line is approximately 100 feet north of the southern borneeds to be relocated to the actual property line.	undary of th	e site. The fence line
2.			
2.	Land Use Changes On Site   N/A  Remarks:		
2			
3.	Land Use Changes Off Site		
-0	VI. GENERAL SITE CONDITIONS		
4 D			
A. R			
1.		ads adequa	te N/A
	Remarks:		
B. O	ther Site Conditions		
	Remarks:		
VII.	GROUND WATER/SURFACE WATER REMEDIES Applicable	ole 🗌 N	J/A
A. G	round Water Extraction Wells, Pumps and Pipelines 🖂 Ap	plicable	□ N/A

1.	Pumps, Wellhead Plu	umbing and Electrical
	Good condition	
	Remarks:	
2.		pelines, Valves, Valve Boxes and Other Appurtenances
	Good condition	☐ Needs maintenance
	Remarks:	
3.	Spare Parts and Equ	
	Readily available	☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
	Remarks:	
B. Su		Structures, Pumps and Pipelines
1.	Collection Structures	s, Pumps and Electrical
	Good condition	☐ Needs maintenance
	Remarks:	
2.	Surface Water Colle	ction System Pipelines, Valves, Valve Boxes and Other Appurtenances
	Good condition	☐ Needs maintenance
	Remarks:	
3.	Spare Parts and Equ	ipment
li P	Readily available	☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
	Remarks:	
C. Tr	eatment System	Applicable N/A
1.	Treatment Train (ch	eck components that apply)
	☐ Metals removal	☐ Oil/water separation ☐ Bioremediation
	☐ Air stripping	Carbon adsorbers
	Filters:	
	Additive (e.g., che	lation agent, flocculent):
	Others:	
	Good condition	☐ Needs maintenance
	☐ Sampling ports pro	operly marked and functional
	☐ Sampling/mainten	ance log displayed and up to date
H F S	Equipment properly	y identified
	Quantity of ground	water treated annually:
		water treated annually:e water treated annually:

2.	Electrical Enclosures and Panels (properly rated and functional)
	□ N/A
	Remarks:
3.	Tanks, Vaults, Storage Vessels
	□ N/A
	Remarks:
4.	Discharge Structure and Appurtenances
	□ N/A
	Remarks:
5.	Treatment Building(s)
	Chemicals and equipment properly stored
	Remarks:
6.	Monitoring Wells (pump and treatment remedy)
	□ Properly secured/locked    □ Functioning    □ Routinely sampled    □ Good condition
	☐ All required wells located ☐ Needs maintenance ☐ N/A
	Remarks: Wells were in the process of being sampled during visit. Any faulty lock, broken hinge, etc.,
	etc., were addressed during site inspection.
D. Mo	onitoring Data
1.	Monitoring Data
2.	Monitoring Data Suggests:
	☐ Ground water plume is effectively contained ☐ Contaminant concentrations are declining
E. Mo	onitored Natural Attenuation
1.	Monitoring Wells (natural attenuation remedy)
	☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
	☐ All required wells located ☐ Needs maintenance ☐ N/A
	Remarks:
TO 1	VIII. OTHER REMEDIES
If there	e are remedies applied at the site and not covered above, attach an inspection sheet describing the physical
nature	and condition of any facility associated with the remedy. An example would be soil vapor extraction.  IX. OVERALL OBSERVATIONS
A.	Implementation of the Remedy
	Describe issues and observations relating to whether the remedy is effective and functioning as designed.
	Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant
	plume, minimize infiltration and gas emissions).
D	The remedy needs to be optimized in order to contain and remove contaminants from the ground water.
B.	Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. There are no known O&M issues.

#### C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

There are no known early indications of potential remedy problems.

#### D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. There are no known opportunities for optimization.

Appendix E: Groundwater Monitoring Data 2003-2014

Appendix E
Historical Groundwater Results from 2003 to 2014Q1
Pesticides and Metals for MW-1

State   Column   Co																								
		Sample L	ocation:			HW-1	MW-1	HW-1	MW-1	PW-1	NW-1	HW-1	MW-1	HW-1		1,000	- 100	3						
		Semp	de Type:			N N	POS/10/2004	11/16/2005 N	11/16/2005	12/13/2006	12/13/2006	12/04/2007	12/04/2007	12/03/2008						12/12/2012 00	MW-1 6/18/2013 09	MW-1	NW-1	MW-1
	Analyte	RG	Units			- 1					2	u .	£	z	£	z	z	z		z	z	z	z	N
	4.4-000	10	lion.	0.0311	1000																			ı
4-4001   2	1.1° DOE	0.1	1	0 4 0 0	0 0	7000	0.550	0 610 0	0.000	0.020	0.000	0.02 U.)	C 02 (T)	0.021.0	0.022.0	77	0.0410	0.000	17.000	ľ	ı	ı	٠	
Application   Comparison   Co	4,4°-D0T	0.1	109	0.200	11000	7.000	0.700	0.0100	0.200	0.020	0.610.0	0.02 m	0.02.01	0.023.0	17700	3	0.0015 3	0.026.01	00000					0.00133
Approximate   2.00   1.00	Aldrin	0.002	100	0.00	0.000	0.70.0	0.020	0.014.0	0.05 0	0.000	0.6100	0.0123	0.02 ut	0.021.0	0.021.0	5	0.64.00	0.000.0	0.0000				0.000	0.023.0
Part	Alche-814	9000		1		-	0.000	Daysell	0.00000	0.100	0.0005.0	2.01	10.00	0.01111	5.011.0	144	0.00048.3	0.0031.11	7 50000				0000	0.000
	alpha Chlordane	2	100	0.0111	000111	0.033	0.035 3a	0.022 a	0.014 3a	0.01 14	0.0095.0	0.01 10.0	201.00	0.533.0	0.013.0	3	0.00171	0.0018 1	1 1000					0.000.0
Continue   Continue	Parts 484C	0.02	You	0.2012	0.121.	0.100	0.000	0.0004.0	0.0000	0.000	0.0005 U	0.01 (1)	00 100	0.011.0	0.011.0	3	0.02 td	0.036 cu	A 0.35 etc				•	e 5900"
Procession   Company   C	deb-81C	9000		0.0050.1			0.5503	0.79 0 a	0.25 D a	0.16 a	0.21 a	0,131a	0.12 la	0.089 a	0.093 a	2	0.094.12	- 8900	0 0000	Ï				0.025 U
Concession   Con	Dicidin	0.002		0.000	C TOOM	0.000	0000	0.309417	D 06000 0	D 100	0.0095.0	2.01 4.1	0.01 UI	0.010.0	0.011.0	3	0.000, 111	0.000711	0.000					0.0111
Marche   Marche   Marche   March   M	Endosulfan I		, you	0.22.0	1 6	2 2 2 2	7700	0.6700	0.02.0	0.000	0.015 U	2 02 cu	0.0130	0.021.0	0.120.5	41.	0.0037.14	0 0047 1.			1			0.000.0
Property   Property	Endosulfan II				1 0		0.000	0.000	0.00000	20100	0.0045 3	00100	DOI: 0.0	0.00343	0.00343	144	0.000	11 3000				25		# S6000
Part   1   1   1   1   1   1   1   1   1	Endocullan cultate		i von	0.000	7700	7	0.020	0.0100	0 025 0	0.025	0.026	0.018 3	0.0193	0.023	0.018 3	3	0.400	0.006111	0.000					0 570 0
Consistence	Endrin	*	100	0.020	100	100	15000	0.010	0.07.0	0.62.0	11.610.0	2007-017	0.07(0)	0.000	0.000	77	330	0.078.41	0.000					0.023.0
Continue   Continue	Endrin aldehyde		101	0.000			0.700	0.020 0	0.02 0	0.000	0.019.0	0.02.00	0.02 ut	0.022.0	0.021 U	3	0.00143	0.0053 3	193201					0.000
1	Ordin ketone		You	0.058	0.0423	0.007	200	Contra d	0.000	0.000	0.014 (4	0.013 3	0.0123	0.023.0	0.150.0	4	0.64 (1)	0.0065.1	2036613					0.031
Mainta-Ordinary   1	mma 8HC (Undane)			0.052 3	0.037 3	0.000	0.01	0.0004	0.084	0.0723	6600	0.092.3	0.078)	0.087	0.081	2	0.078 3	0.072	0.00					0.028.00
	garrana-Orbitdana	2	MAY	0.23.3	0.01.0	0.01	0.00	1000	10000	0.00	200000	201103	0.01 0.0	0.011 0.0	0.0033 3	17.4	0.0013 3	0.025.0	0.0053					
Market Frozenski   Market	Heptachlor	4.0	707	0.000	0 00 0	0.01	0.5111	0.0000411	0,000	0.01.0	0.000111	10.100	0.000	0.101.0	unitu.	2	207.01	0.035.0	0.025.0					7107
Publication	leptachlor spande		1401	0.010	0.54 ()	0.000	0.010	D LOSeff L	0.00000	0.000	0.0005	0.01 0.1	0.01.00	0.000	0.010.0	77	3 02 03	0 000 U	0.025.0					10000
Total-bracide  1 agi, 10 10 00 00 00 00 00 00 00 00 00 00 00	Methoxychlor		No.	0.1.0	0.10	010	0.1.0	0.084	1000		DINAVE.	0.01 1.11	0.03 101	617714	OFFIT IS	2	0.07.110	1179611	13.5000					10 10 10
Particle   Particle	Toxaphene	ŗ	161	7.7	10	0.612	1190	0.00	17 00 00	0 .	0.095 11	0171	0.1.03	0.11.0	0.11.0	ž	0.2 G	0:0	0.11					
Chemister   100   right   114   right   righ	Total Pesticides		MA	0.1530	0.2291	0.5	0.505	0.422	0.140		0.47	j	501	7.7.7	110	718	1.00	0.25 L	0.250					0.34.0
Chemium   100   pagh   143   144										2000	0.0033	0.203	0.239	0.1994	0.1907	7.tA	0.10400	0.1563	0.1271					0 1343
15   194   114	Chammin	100	No.	14.4	1771	1,14	1.14	V2;	MA	74.4	21.5	1												
Management and   Management	Lead	13	176H	123.	266	104	144	111	114	V,	9.0		Ε,	4	11.4	2	N.A.	3	4.43	3.5.1	101	174	5.4	MA
Te & Countrele													V39	5	10.	1.93	177	10.0	0.01	6.7.3	755	5	0.00	ă
Te sprounely		*	Mengari	100,100																				
fre &crosinely			Vermital (s.	- 1																				
fre &crosinete		×	Jord-Table	DE condition																				
Te Appoint		63	"taraditam	dr Sarth																				
Te accounte		J	Tell Day	a																				
fe appointe		×	Meabula	-																				
fre 4proximely		63	Calmentacy of	5																				
Te aproximete		٠	The volue m	the decired durin	d a secondary di	littor.																		
		)	Arabita nas.	presuptivelyp	sart and tarth.	ely barbled at t	Te approximate co	mortation land	12															
		,	168 arc), 280	1																				

Appendix E	iroundwater Results from 2003 to 2014Q1
	Historical Groundw

							Pesticide	s and Metz	Pesticides and Metals for MW-2							C.7744	MALA 2
	Cample Location.	-asjon-	MANAGE 2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2		7-MM	2-1414	5
	Cample	- Dete	Cample Date: 08/31/2003	09/10/2004	11/16/2005	12/13/2006	12/04/2007	12/03/2008	12/09/2009	03/17/2010	11/30/2010	11/30/2011	12/10/2012	5013	09/04/2013 12/11/2013	12/11/21	N N N N
	Sample	Sample Type:	N N	N	z	z	z	z	z	z	z	z	z	z	z	z	z
Analyte	RG	Units															
Pesticides										10.000	0.026.11	0.025.0	0.025.0	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-000	0.1	1/6ri	0.02 U	0.02 U	0.0067 3	0.021 U	0.02 0.0	0.02 U	d .	5 5	0.026 11	0.025.0	0,025 U3	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	אמין	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0 70 0	4	3 3	0.1176.111	0.025.0	0.025 U	0.025 U	9,025.0	0.025 U	0.025 U
4,4'.DDT	0.1	אפער	0.070	0.02.0	0.0067 3	0.021 U	0.02.03	0.020	S .	E 03000 0	0.00031111	0.00211	0.00211	0.002.0	0.0023	0.002 U	0.007 U
Aldrin	0.002	hg/L	0.011	0.011	0.0098.0	0.01.0	10100	0.010	4 4	0.0000	0.066211	0.006111	0.0061 U	0.000.0	0.006.0	0.056 U	0.006 0
alpha-BHC	9000	J/Bri	0.0113	0.01 U	0.0050 U	0.0100	10100	0.01.0	X 8	0.0210	0.026 U	0.025 U	0.025 UJ	0.025 U	0.025 U	0.025 U	0.025 U
alpha-Chlordane	7	ng/L	0.01 U	0.01 U	0.0000	0.010	10°0	0.010	477	0.0211	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02.0
beta-BHC	0.02	hg/L	0.01 U	0.010	0.0098 U	0.010	0.01	0.010	4.0	0.006.11	0.006213	0.0061 U	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
delta-BHC	900.0	DQ/L	0.010	0.010	0.8600.0	0.010	0.01	0.010		Logodo	0.002110	0.00213	0.002 U	0.007 U	0.002 U	0.007 U	0.0021
Diedrin	0.002	Dg/L	0.02 U	0.0210	0.00563-e	0.0211)	0.02 1.13	0.02	4 .	5 690000	0.05611	0.03511	0.025 U1	0.025 U	0.025 U	0.025 U	0.025 U
Fndosuffan I		J/Gri	0.01 U	0.01 U	0.0098 U	0.01 U	0,01 U3	0.010	ď.	0.02.03	0.025.11	0.035.11	0.025.11	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		Ug/L	0.02 U	0.02 U	0.02 U	0.021 U	0.02 UJ	0.02 U	NA.	B 500	0.000.0	0.0000	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endoculfan suifate		LIG/L	0.02 U	0.02 U	U.02 U	0.021 U	0.02 UJ	0.02 U	NA	50 50	0.020.0	0.036.0	0.025.01	0.02511	0.625.0	0.025 U	0.025 U
Endin	2	Ma/L	U.07.U	U 02 U	0.02 U	0.021 U	0.02 03	0.02 U	VIA	0.04	0.026.0	0.025	0.035113	0.02541	0.02511	0.07511	0.875 ()
Fordin addenyde		1/Dri	0.0711	0.071	11 20 0	0.021 11	0.02.01	0.02 11	¥24	[D # 0]	110/010	10500	0.035 11	0.03511	0.025 to	0.025 U	0.025 U
Endein ketone		1/ori	0.02 U	0.02 U	0.005 3	0.021 U	6.62.03	0.02 U	A.V.	0.00123	0.020.0	0.0200	0.000	0.000	0.0211	0.0218	0.02 U
Amma BHC (lindana)	00	1/0/1	0.010	0.010	0.0098 U	0.10.0	0.01 UJ	0.01 U	MA	0.02.03	0.026 0	0.04.0	0 4000	1 1 1 1 1	11.000	0.025.0	0.025 U
gamma-Chlordane		no/L	0.010	0.010	U 8200,0	0.010	0.01 UJ	U.01 U	NA	0.02 UJ	0.026 U	0.020.0	10.020.0	0.000	0.02519	0.025 U	0.025 U
Hentachlor	0.4	na/L	0.010	0.011	0.0098 U	0.01.0	0.01 U.1	0.01 U	NA	0.02.01	0.075 0.1	0.025.0	0.020.0	0.035.0	0.62511	0.02511	0.028.0
Hantachlor secondde		LICALL.	0.010	0.0113	0.009810	0.0111	0.0100	0.011	NA A	0.02 0.1	0.000	11.00			3.0	0.113	0.1.0
Methodeblor		1/01	0.10	0.1.0	0.098 U	0.10	0.1 U3	0.10	NA	9.2 m	0.1.0	0.1.0	0 110	2 1 2	0.35.0	0.25(1)	0.25 U
Daniel Control	c	1	Ξ	0.6.0	0.98 U	2.0	10.1	10	NA	3	0.26 U	0.23.0	0.42	0 0 0			=
Total partidae	n	1	; =		0.025	כ	2	Э	NA	0.00268	כ	n	0	0	2	2	2
lotal resocides		100													l	1	
Metals					418	MA	7.1A	NA	5.3	NA	2.0	D \$	2.03	NA	11/	) (n	N.N.
Chromium	100	hg/L	V.	4	E s	<u> </u>	4.4	MA	1.43	11A	0.01	10.0	10.0	MM	NA	100	NA
read	15	J/βπ	NA	MA	NA.	163											



SCD058753971 September 2014 Appendix E
Historical Groundwater Results from 2003 to 2014Q1
VOCs, Preticides and Metals for NW-3

This control   This
Harmone   Mail
The property   The
National Column   National C
This control   This
Particle (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
March   Marc
Parisiment   Par
Particular   Date   D
Default   12   13   13   13   13   13   13   13
Part
Part
Heath   2   Just   Court   C
The control with carry of the control with c
And Controlled Service and Controlled Service
2 Int. Control carrier Service and control carrier control carrier car
Third column   Colu
Tachel words
Final Control of the
Flatebrown 3 agt in gen ivo 2591 No. 1991 100 100 100 100 100 100 100 100 10
Part
Threshold 150 to the total to the total 150 to the total
100 (19) No. 10: 10: 10: 10: 10: 10: 11: 14:1 74:1 10: 10: 74:1 27:1 11: 10: 10: 10: 10: 10: 10: 10: 10: 1
11 194 to 14 15 15 15 10 10 11 154 11 154 11 15 15 15 15 16 21 16 17 16 21 18 18 18 18 261 261 17
THE TAX TAX TAX TAX TAX TAX TAX TO TAX

Appendix E Historical Groundwa ter Results from 2003 to 2014Q1 Pesticides and Metals for MW-4

Sample parameter   Sample para		Sample Date Sample Lyp RG Unit	e: 08/20,			The second of the second	and do to the fine	12/06/2007	12/03/2008	12/11/2009	03/18/2010	15/05/50151	44/01/40				2	
Exercise         5         tpl         section         6         control	Modyte  Berzele Toluen Toluen Toluen Paylerzene m.Xylene o-Xylene o-Xylene 44:000 44:000				99/10/2004 N	11/16/2005 N	12/13/2006 N	z	z	z	z	z	z	z	z	:	ź	z
Page-stree   S   404   S50   O.623   C.623	Berzene Toluere Ethyleszere ethyleszere mixylere oxylere (Tota) Mics 44:000		its															
State   Stat	Luern Luern Learnache							0.40.1	0.41.1	Ŧ,	17.7	0333	0.58 J	0.0	34	148		
1	Luces convenient chart of the c	222		100	033	0.63 J		0490	200	5	-	43	6.3	193	(050)	19	0.48 ]	)
Control         14, 150         150 0         200         21         5.5         19         20         200         15         15         200         15 <td>t-busy ether sylene (ylene (sylene e (Total) ) COO</td> <td>333</td> <td></td> <td>96</td> <td>5.1</td> <td>7</td> <td>1.1</td> <td>0.78</td> <td>900</td> <td>3 6</td> <td>-</td> <td>330</td> <td>120</td> <td>170</td> <td>7.1</td> <td>Ti.</td> <td>5,4</td> <td>1</td>	t-busy ether sylene (ylene (sylene e (Total) ) COO	333		96	5.1	7	1.1	0.78	900	3 6	-	330	120	170	7.1	Ti.	5,4	1
	cylene cy	9 :		8	130 D	330D	21	5,5	2	930	×1	*	47.4	15.5	77	7	23	-
Villet         196         197<	(ylene (ylene (ylene (ylene (ylene (ylene (ylene (ylene (ylene			-1	10.01		4:	4	d	1	1 +	***	200	777	-14	ă.	477	414
	(Yene (Total) -:DDE -:DDE	-		10	11	415	475	S.	4	2800	5	1 4 5	1	27	1.4	d,	15	404
	(Total)	3		77	7	7777	47.	4	4	1200	100	0013	0001	1100	1771	4	23	\$14
	4.000 4.00E 7.00T	: 5		99	460 D	2000 D	130	%	700D	4300	7.00	mre	1000					
	1:000 1:00E 1:00T									***	ocania	7	11/4	0.510	1.3	0.81	0.283a	0.593a
44°CDE         11         14h CSS         11 <th< td=""><td></td><td></td><td>0 V</td><td>100</td><td>1040</td><td>0.38.0</td><td>6219</td><td>0.123a</td><td></td><td>1</td><td>PLINITA</td><td>1.4 0</td><td>1.53a</td><td>4,510</td><td>0.0</td><td>110.0</td><td>0.71NJa</td><td>1.4 a</td></th<>			0 V	100	1040	0.38.0	6219	0.123a		1	PLINITA	1.4 0	1.53a	4,510	0.0	110.0	0.71NJa	1.4 a
4,50T         0.1         pp         Corp.         0.4         Corp.         0.4         Corp.         0.4         Corp.         0.4         Corp.         0.4			. V		0.4	1 10 1	0.38Ja	15.18	BC71		and the stand	1.11		0.81	13.0	0.6738	1.4 a	100.00
Might         0.002         µµ (2.002)			0		1186	000	4) 21.5	0.36 Ja	- 630	1 2	PLINGER	7.5	0.20	0.59 a	24.80	123a	0.0400	1.43a
appropried         20         infl         63Da         259 a         43Db         14Ja         38Db         15 a         14Db				230	0,43a	0.814	0.293a	0.100	uss a		LI DIA	26.0	6.2 a	5.9 a	3.13a	2.1 0	1.6 a	1.7 a
Page by Color   Page				3Da	2.9 a	4.3DJa	1.43a	3,8010	1.0 a	\$ 7	1401	0.813	0.553	0.5310	0.643	0.47 3	0.47 3	121
beachtful (size)         100			o V			DETE	0.77.)	all	1.1	1 3	2007.4	19 0	11 a	11 0	20 a	0.00	14 a	19 a
Objective         100         104         2.03         1.43				DJa	19 D a	21039	13.38	22038	16.9	- 2	4.5DJa	7.5 8	3.1 a	14 a	3.1 a	***	2.8 a	3.5 8
Deletary   1,000, 1,014   6,90 a   12,00 a				8Da	2.8 3 a	2,638	1.4 38	1001	120.0	7	14030	103a	6.2 a	8.8 a	15 a	. 18 .	13 a	1/ 8
Endeasifarti         ig/l         0.477         0.477         3.11         0.470         0.477         3.11         0.470         0.477         3.11         0.470         0.471         1.11         0.471         0.471         1.11         0.471         0.471         1.11         0.471         1.11         0.471         1.11         0.471         1.13         0.471         0.471         1.13         0.471         1.13         0.471				9Da	12 D a	12DJa	9.6 Ja	13038	111	. 3	0.35 DJ	130	in the	7150	0.773	2001	0.50	000
Endersident light sign sign sign sign sign sign sign sign	Endosulfan I	ı			0,530	0.000	0.47	04423		3	171111	0.32 NJ	0.913	0.510	0.75 )	1.13		
finding sizes         ppl (s)         mpl (s)	Endosufan II	ĭ		36	7	7.50	1.8.1	027.5	5		7-40	1.53		0.630	1. 1.	2.6	23	
Endin	Endosulfan sulfate	ĭ			T	1 7 1 1		1007		1	0.78 D3	1.3	1.33	0.51.10	1.9	0.67 3	0.493	0.88 )
right statement of participations         147         120         240         111         150         113         250         250         260         27         26         26         30         27           Performence         147         140         220         260         110         100         17         26         26         26         30         22           me8-H-Claridare         147         420         260         110         100         17         110         0.26         17         26         26         10         174           me8-H-Claridare         2         147         420         0.20         10         110         0.29         10         110         0.29         10         110         0.29         10         110         0.29         10         110         0.29         10         12 <t< td=""><td>Endrin</td><td>2 K</td><td></td><td>Į.</td><td>T F</td><td>1.35.1</td><td>0.34)</td><td>0.20</td><td></td><td>1</td><td>CNO 6CA</td><td>0.85 3</td><td>0.65 J</td><td>-</td><td>1.000</td><td>2.1</td><td>1.9</td><td>73</td></t<>	Endrin	2 K		Į.	T F	1.35.1	0.34)	0.20		1	CNO 6CA	0.85 3	0.65 J	-	1.000	2.1	1.9	73
Endranteting         IpA         14D         22D         26DJ         11BJ         25DJ         11BJ         25DJ         11BJ         25DJ         11BJ         11BJ         11BJ         11BJ         12BJ	Endrin aldehyde	ĭ		Ĭ,	T-1-	7.67	0.16 )	CIT	001	17-	10 01	13	21.3	28	92	99	8	. 38.
mage-tractional of a part of 4.2D at 1.13 at 1.	Endrin ketone	ĭ		140	320	28 D J	í BI	22.02	* 300	10	5.6DJa	10.40	2.5 a	2 8	1.6 a	1111	138	1 8
Page Approximate   Page Approx				2D a	2,538	3,6 Ja	1.1.3a	45038	8 0630	£ 11	1.101	0.22.0	1200	0.6110	0.86 3	1	0.511	
Hepation 0.4 Lg/L 0.12 2.0 0.19 0.19 0.10 0.10 0.10 0.10 0.10 0.	gamma-Orlondane		U VE			0.50	0.16 )	0.23	2 0	. :	[NG 1CO	20000	100	1350		-		7 0 7
Papellor eponde	Heptachlor			7.12	12.00	0.225.0	1.		3 :	1 11	[NG 670	1707	4.7	0.511				
Nethorychior         LpA         11 C         12 C         11 C	Heptachlor epoxide	1	D.V.		962.43	0.454	0.25)	0.20	5 5	1 1	0.7 N	7	0.31	9.	0.0	0.643	1.23	200
Toughers 3 Lg/A No 15 No	Methosychion	1		15.		150			1	90	2.1.5	SONDA	110 8	77.3a	1103a	0.000	14038	270 a
Cost Pestadoias 4gA 4564 71.6 69.5 97.12 81.98 00.00 5: 11.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	Toughene	1 "		10.15		1.1	48 Ja		20.00	1	72.02	140.6	164.91	135.69	185.82	392.85	202.85	348.47
Oromium 100 tigh 115 115 115 115 115 115 115 115 115 11	Total Pesticides	1		5.64	71.6	69.5	97.12	81.48	90790									
000 100 100 100 100 100 100 100 100 100	stats	ı			***	611	475	177	12.	1701	UTs.	0.5	7	0.5	100	4		1 1
	Chromum		Vo	4				÷	-1		477	0.00	1030	4.13	1777	5	0.00	100



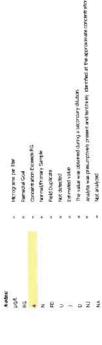
Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-19

1,100   0.1   i.e.	Analyte	Sample Location: Sample Date: Sample Type: RØ Units	Outc. 12 Type: Units	Sample Date: 19/2/1/211 Sample Date: 19/2/211 Sample Type: N  O Units	MW-19 Machigasia M	MANAGEM TEPTAZARE N	Make tw 17/2/2/2/16, %	PM-19 17/Ke/2017	er Mari	изунда В	Mac14 (ft/st/2001) N	17/07/10 17/07/10 14	Mich UAN/2000 N	MINELLY CHAPATA	POWERS NATIONAL	Mile-14 M/H/C/CITT	PARC 14 12/17/20: 1 N	MM-14 (1727-0114
Vi Cot   1   1   1   1   1   1   1   1   1	Penikaldan											ı	ı		ı	Ì		
	44.000	7	YOU		10C (Sc	.02		(mask)			l	I	I					
At 10 Till         old         Att 10 Till         old         Att 10 Till         old         old </td <td>1,7° DOE</td> <td>0.1</td> <td>TOTAL STREET</td> <td></td>	1,7° DOE	0.1	TOTAL STREET															
## 0.002 of colors of colo	1,1 001	0.1	You							•								
See See No.         3.00         4.01         0.0023         0.0133           See See No.         1.01         0.0023         0.0133         0.0133           See See No.         1.04         0.0023         0.0023         0.0133           Control of See No.         1.04         0.0023         0.0023         0.0133           See See No.         1.04         0.0023         0.0023         0.0023         0.0023           See See No.         1.04         0.0023         0.0023         0.0023         0.0023           See No.         1.04         0.0023         0.0023         0.0023         0.0023         0.0023           See No.         1.04         1.04         0.0023         0.0023         0.0023         0.0023         0.0023         0.0023         0.0023         0.0023         0.0023 <td< td=""><td>Alden</td><td>0,002</td><td>You</td><td></td><td></td><td></td><td></td><td></td><td></td><td>5</td><td></td><td></td><td></td><td>300000</td><td></td><td></td><td></td><td></td></td<>	Alden	0,002	You							5				300000				
About Order 2 and About Order 3 and About Order	apho Brc	9000	You	1000	2004								0.00	10.0	j	4		11/1
No. 20 by sight         out 20 by	alpha Chlordano	~	You							4				117-04	100000	(A) Beach	1000	0,000143
Age by Control	かのの	0.02	Yo.						. 000	1				0.00		9		
Costant   Cost	dutin BHC	9000	You	0980					000	1 - 1	0.0133							
Control   Gal   Control   Gal   Control   Co	Cidhin	0.002	10 k						O canada	1				0.346.5	0.000	full spile	1939.1	GABBC
Section   Sect	Endosultan I	4	- OA						action a	5			1000					0.002
Availability (c)	Enablish:1	್ಷ	101					1 0000										
The first is set to the first in the first i	triduality suifate	- 1	You					77000		1							1973	
Annual Street Control	Enden	T O	YO															
The contract   Control	Endin 333t-pdc	) <b>3</b>	DA							•								
	Enthinketine	3	dA						1					3.4.60				
Manual Color   1	gomme Brit. (Lincolne)		10							100								0.000613
### ### ### ### ### ### ### ### ### ##	gammic Orlordano	74	ot							9						0.00193	0.0002	
Attracted growth sight  Attracted growth sight  Fortier of the sig	Heptarilo	0.1	n/c															
Methods by Log A         COLD COLD COLD COLD COLD COLD COLD COLD	Physiolia good.	1	to.															
Construct	Ph. Pospetier	ুন	p															
Fig. (1907) 1907 1907 1907 1907 1907 1907 1907 1907	Toughand	3	Yo							360								
Oversian 100 total in the control of	Total Postodica	71	ak					0.042		1								
50 10 11 5 9th 5 5 5 5 5 5 5 10 10 10 10 10 10 10 10 10 10 10 10 10	cross		ı	ı	I			7107	COLOR	4	0.013			100	0	0.0012	0.000	0.0075
5 10 10 10 10 10 10 10 10 10 10 10 10 10	Overnor		70			1).	97.4	27.4	100	2115		l	ı	ı	ı			i
	i nat		10							9	,		12	18		4	5.3	1,54

134.223.22

Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-5

	Sample Location: Sample Date:	cation:	MW-5 08/20/2003	MW-5 09/09/2004	MW-5 11/17/2005	MW-5 12/12/2006	MW-5 12/07/2007	MW-5 12/04/2008	MW-5 12/09/2009	MW-5 09/16/2010	MW-5 11/30/2010	MW-5 12/01/2011	PAW-5 1 12/11/2012	MM65 06/18/2015	MW-5 09/04/2013 N	MW-5 12/12/2013 N	MW-5 03/24/2014 N
	Sample	e Types	z	z	z	z	z	z	z	z	z				15,000		2540
Analyte	RG	Units															
Pesticides										111775	0.5000	1000	1155.00	0.020%	7:200	1 5000	127.6
4,4.000	0.1	You	0.53.0		3.77	0.025.67		1111	1	3 5			10 400-1	20.00	211.00	27.5	1577.0
44.006	0.1	NA.		11 (70)		1.55%		717	2	3		1			1 3/1/2	9 1	15000
14.00T	0.1	You		0.923	10,000	A 22 H			1	The business				1	n mms a	2000	11.00
	0000	You	0.000	- 5	(120021)	11,55931.1	100	GOT:	1	2.00413						10.0	0.000000
September 1	9000	Yan			1.000.1	1016.84	To state	(0.00 Pa)	1		11.000			100		1000	
det a Chicedone		101			U. 1500 U.	0.00056.01	0.005-20	0.00		11700							11.11.11
PART OF THE PART O	0.02	100	1.1		0.0081.1	1156-010	0.049 Ja	214411	d.	0.757.0		1					100
delea Birty	0.006	14	1003400		1.50	1,16,000	15750	1170	7.1	D 800	1.0%	21.00.15					1000
4	0000	1		3	2000	10000	0.113a	267.130	17.2	0.00123	0.000	13.00					
Enden Han T	2000	1		1 - 14	11.00	1.15.74	0.010.0	308/4/11	17.	0.07.1.0	7 % 0	1000		0.0000000000000000000000000000000000000			
The state of		1		1000	13/10/02	0.02005	0.016 3	0.000	474	110410	0163610	7 KUC	0.00				
DIGOSATISTI II		1			21 19 10	1.65	0.033	7176	474	B 500	10.25	1000	1022.1	3 17 1	CATOON		
Endosulfan sulfate		Š							2	114.11	10.00	- 100	11/4/24/1	V.	11000	1	2000
Endin	2	Hay.		11211				100000	1991	O COLUMN		0.02544	11.36	1,57	0.000	115	100000
Endrin aldehyde		1/6/		1	10000						71.00	1 100	11.00	(10,50)	200	10.000000	0.0069 3
Endm ketone		1/01	0.0043 J	4	7.70	1112011	00000					0.00131		27445311		1.00	11.37.11
gamma-BHC (Undane)	0.5	1/01	0.000	11.547	11/25/11	116000	1 1 1 0 0		1			1150		41 × 11+	200	* 1	1200
camma Chlordane	2	LQ.	2011		F-5455 F	0.08/0.0	117700		4	3		1	14.0	4.17	110,000	×	10000
Heptachlor	0.4	1/0rl	0.11.0	110,000	0.000	0.00000		116	1	8 5			1 44.11	1.61	100	0.0200	
Heptachior aposade		NO.	7	10.00	0.5050	1 65000	0.000	1100	1						0.0037 3	0.100	1.1.
Methodolia		You	117		118591	11.54	0.11.1	10.00	1						7		1. * 1.
Toochere	m	Trans		11.4	1251	1.6.6.1	-		4	1-1		0.0000			0.0092		69000
Total Pesticides		No.	0.0043	3377	100	10	0.274	(4)	150	00017	NA.	0,000					
Netals									3404	*	7.5	15	73	15.	173	4.23	9.
Chromum	100	You	13	4	NE.	Y) :	7,7			1		į	9	15	171		4
- Invest	ň	Acres A	177	100	11.5	199	1,44	4,1	131	1							



SCD058753971 September 2014 Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pestkides and Metals for MW-6

	Analyte	Z Z Z	mple Date: mple Type: Units	MV 6 08/20/2003 N	MW-6 09/09/2004 N	HW-6 11/17/2005 N	MW 4 12/13/2006 N	MW-6 12/05/2007 N	MW-6 12/02/2008 N		10.000		MW-6 12/01/2010 FD			 				MW-6 9/04/2013 DI	MW-6 1/04/2013 12 FD	MW-6 1102/11/21 0	MW-6 13/24/2014
44,000         61         90         0.000         0.011         0.01	4,4.000	0.1	MM	0.62.01	0.62.0	0.0153	0.02311	111.00 4	11 200 0											ı		ı	
Mathematical Control   Mathematical Control	900-A.A	0.1	3	0.0293	0.019.3	0.014.3				114	₹ Z	0.024.01		0.04.10	0.04111	Ĺ	ı		ı.	ı	ı		
Mathematical   Math	100.44	0.1	M	0.0583	0.03	0.040	1 9000	2000	1700	111	42	0.020 0		0.04 0.0						99	L	_	0.0036
Application         90 Settle	Aldrin	0.002	Yes	at 95000	0.010	0.000011			6700	¥ ;	ş	0.0233						- 2	ě	73,700		0.020.0	0 025 0
Parameter   2   144   Column   Column	Spha-BHC	0.006	Y	0 01 10	0.0311	11.00-00-11		10.00	0.110.0	5	2									20			0.012
Part	alpha-Olordere	~	Viri	0.6111	0.0096 1	0.009817	0.000		0 100		NA.				0.004 1.0								9 502 U
	Deg-GHC	0.02	PA N	0.000	0.086 s	0.024 a	0.0153	0.014.1		717	NA.						_	000	_			5	3
	della-BHC	0 004	New .	0.010	0.6111	0.000911	0.013.11	00000		14.4	FLA										2		0.005
Probability   Property   Property   Probability   Property   Property   Probability   Property   Prop	Deithn	0 002	You	0.20 8	0.13 a	0.1 a	0.07 a	0133.		1	1												0
Part	Endosulfan I		M	0.01.0	0010	O 5400 0	0.008	2 61 113	0.011	***	11												12 3
Particle	Endosullan II		You	0.020	0.52.0	0.0211	1,000	0.034.1		2	UV												2
Part   1 May   1 mark   1 ma	Endosulfan sulfate		ž	0.000	0.020	0 01 0	7 170 1	0.02 (1)	0 0000	2 ;	2 :												0 025 11
Fig.   Str.	101	2	Von	0 67.19	11,00	0.55	11 12 12 11	10000			2								g en				6
Particulary   14    1845   1	Chd'in aldehyde		¥	0.62.0	0.020	0.22.0	0.0233	0.015.3	0.070		1												0 575 0
Part   Court   Court	End in lettine		¥	0.045.3	0.073	0.008	0.047.3	0.033	2000		1												0.075.11
Participation   2   pg/L case   2   pg/L cas	amme 6HK (Lindene,	.) 0.2	×	0.01	0.12.0	0.0058	0.011.0	0.01111			2 :											0.022 )	ri.
Heading	gerrma-Chlordane	7	×	0.016 3	0.013	0.012	0.0114	2.01.10	1 0000										000			0.013.7	-
Perfective conditions	Heptachics	0	ha)A	11100	11.10.0	0.009811	0.08711	1.00.111			210									9			ų.
Touristics july 15 to 0.000 0 010 0	Preplachior spoolds		ž	0.000	0.100	0.0000 0	0.010 6	0.01 100	0 00078 3		1 7											1000	0.000
Tourborse 3 joy 1.15 1.2 0.000 0.000 1.00 1.10 N. N. 1.2 1.13 1.00 0.03.1 0.03.1 0.10 0.10 0.10	Methonychia		MAN	0.141	712	0.098.0	0 11 0	1010			0												2
	Toughore	•	ž	1.5	1.2	0.25 U	0.98.3	10.1		1 2													0 573 0
Oronian 100 pg/ NA PLA PLA PLA PA		1	My	1.9109	1.5625	0.282	1.153	門。	04/19	- 12	2 2											0.02.1	71 - 12
150 1497. NA TAS TAS TAS TAS TOU 150U 5-U 5-U 144 TAS TAU 5-U 144 TAS TAU 123 TO 16-U 144 TAS TAU 15-U 15-U 15-U 15-U 15-U 15-U 15-U 15-	sye.										VIV												
15 1907 NA	Chromban	100	M	NA	744	75.8	71.4	NA	76.6	ı	ı				ı			ı				0.1815	0.127/6
150 160 NA 73U 61U 16U 10U MA AA 3A	Lead	15	MA	177	144	NA	7/1	2	1			0 1	3	74			0.5	l	ı	ı	ı	ı	
		li								I	ı	0.00	10.0	154			10.11					***	10.1



Appendix E
Historical Groundwa ter Results from 2003 to 2014Q1
Pesticides and Metals for MW-8

	Sample Location: Sample Date: Sample Type:	mple Locations Sample Dates Sample Types	MW-8 08/20/2003 N	MW-8 09,09/2004 N	MW-8 11/17/2005 N	MW-8 12/12/2006 N	MW-8 12,07/2007 N	MW-8 12/04/2008 N	NW-8 12/09/2009 N	MW-8 03/16/2010 N	NW-8 11/30/2010 N	MW-8 12/01/2011 N	PMW-8 12/11/2012 N	MW-8 06/18/2013 N	MW-8 09/04/2013 N	PAW-8 12/12/2013 N	03/24/2014 N
Analyte	RG	Units															
Posticides										I COLORO	1 71000	1 6100.0	0.00163	1136507	0.0032 3	0.0025 3	0.00243
44,000	0.1	Yen	0.0213	3400.03		116105				0.000			H - W 1 + 1		700		0.000
44,006	0	Von	0.036.3			0.14+C	10.5	0.05.11	1	7				1	1000	1.0.14	0.0025 3
					0.0133	0.04911		111111111111111111111111111111111111111	15	11.41.0		0,000				O COUNTY TO	e conno
4,4-001	1.0	NA.	100000	-		1		0.000	3	d 0.00 cb	111111111111111111111111111111111111111		THE STATE OF	ACCOUNT OF	access as	00000	2000
Aldrin	0.002	1/8/1	occupions.	0014Ja	0004178			0000	100	0.008 Ja	0.00036 J	0.018 a	0.001 8	0.018 a	0.015 a	0,019 a	0.012 a
alpha-EP-IC	9000	You	1204	0.31Da	0.034 a	0.014 a	1000	COIS a		10000	1 500	2.6 5 13	00.0000	0.025 (0.	0.0250	0.0016 J	0.025.0
alcha-Chlordane	~	Acu	0.000	0.100	0,00523	0.0003.0	17.14.57	0.000	1		0.0076.1	- 0000	n 0000	0.059 a	0.057 a	0.059 a	0.047 a
Partiell	0.02	J.Bri	100	0.55 Da	0.047 38	0.033a	50 M 63	0.0-E2 a	1	0.0/4 38	0.0073	DOOR S	L SEDUC	0.0064 a	0.0075 #	0.0065 3 a	0.0053
duly Ber	9000	Year	- minimum	0.11 6	0.013 3.8	0.0093.0	121020	0.000E2 Ja	- Mar	0.0138	00001	2000	00017	0.0001	0.056.9	0.049 a	0.044 a
CORRECTION	0000	1		0.45 D.a	0.07239	0.038 a	0,016 Ja	0.0-13 a	113	0.0583a	0.01339	0.0222 a	0.017 a	DOM:	0,000	200	1 900
Dean	2000	1		1000	Novin	Grant I		0.01111	15	0.000913	0.02.11		0.000	1000	1000		00000
Endosulan		NO.					13100	CHANGE	+14	D. 1600	0.028 [53	0.0041 3	0.024-0.0	0.152 kg	0.0036 J		COOKS
Endosulfan II		ž			0.70		0.000		- 62	7.15.0	11-425-0	* 0.1	200000	75100	12000	1 5000	- C
Endosulfan suifate		YEN	10.00							1 51000	0.52500.0		112210	0.0031 3	11.55	10 5000	0.025.00
Endrin	2	YOU	04.2.10									611	10.00	1.0251	3000	1. 2	10.12
Endrin aldehyde		Jugy.	0.57	7.700	0.00	2000			1 1		1 1000	1100	2554.01	0.0018 3	0.0033 3	0.0018 3	0.0026
Endrin ketorre		Veri	0.113	0.03	0.500	11/11/25	10.00 DE	7 7 7 7 7	1 .	0.000			11 77 1	0.00	0.20	11/00/11	0.0012
camma-RHC (Lindane)	3 0.2	NOV	0.2838		0.0026 3	0.66542.1			14	1000					0.0251	7 2010	0.250
gamma-Orlordane	2	You	0.000	0.000	0.01	0.0032.5	1.1.	1111	1 :	1	0.000		1111111	0.610.4	1 52 16	17 SEC.	0.025
Heptachlor	0.4	767	300		9.715.6	1.0000	7.41	0.000	4 5	70000	2000		7.70	0.0027 3	15,77	133331	200
Heptachlor eposide		You	1000		100	7 (7)	100	11777	14		=		. 11	10 124	10.20	0.110	0.002
Methayotion		101	1 40	16.43.9	1	11.53.1					-		0.000		7.5	0.50	100
Toughere	m	184	7.0		7.7			- 1	1	9	*	0.0963	0.0542	0.142	0.1485	0.1419	0.124
Total Pestodes		You	4.273	1.464	0.1909	0.082	0.031	0.1112	27	0.17761	0,200	20000					
Afotais								(2.2)	136	4040	ič	13	(1) 5	47.1	47.	100	100
Gromum	90	Not	2.14	1,00	:5	1				-113	5	10.10	100	c.	144	TOE	P.B
read	15	hou	104	44	fair	125	199	5	1.9.7			١					



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-10

	Sample Location:		MW-10	PMW-10	MW-10	MW-10	MW-10	PWV-10	MW-10	MW-10	PW-10	MW-10	MM-10	MW-10	MW-10	MW-10	MW-10
	Sample Date: Sample Type:		08/20/2003 N	09/09/2004 N	11/16/2005 N	12/13/2006 N	12/06/2007 N	12/02/2008 N	12/11/2009 N	03/18/2010 N	12,702/2010 N	12/07/2011 N	12/12/2012 N	06/19/2013 N	0	12/13/2013 N	8
Analyte	RG	Units											s	e l			
restructes																A STATE OF	
4,4-000	10	ZY.		0.000	0.22DJa	10.00	0.22.3a	023a	Wt	0.13 3a	0.08 J	N.55.19	8600	11.25 0	0.06 J	0.955 (1	
4,4-DDE	0	No.		0.26 Ja	827.70	0.059 3	0,13 Ja	0.23 3 a	N.	0.15 3 a	0.24 a		0.23a	116511	0.193a	0.17 8	0.193a
4,4*DDT	0.1	Yen		S. September	42.12	(1614)	0.113a	10000	87	0.14NJa	0.0-13 3	11.5.11	0.056 J	0.11 a	0.85000	135.00	0,113a
Aldrin	0 00 0	17th	0.026 3a		0.000	0.023 1a	0.023 Ja	0.0438	210	0.02938	1040 8	200 000		1.162111	0.0075114	o.0693a	
alpha-BHC	9000	Visit.	0.00463	0.00423	0.01	900950	0.010 A	0.0092 Ja	17.7	0.0018 3	0.630	0.90%	0.0124.0	0.00	0.000	0.0011.3	0.00.0
alpha-Chlordane	~	YEN		WORK.	(4)/0	0.0443	0.015 3	0.123	3.6.	0.084 NJ		11.4.1	0.019 3	11.611	10771	0.050	0.082 3
Deta-BHC	0.00	Yen	0.25Da	0.34Da	0.16 3 a	0.077.00	0.15Ja	0.41 Da	12	0.092 DJa	0.13 a	0.253a	0.1 a	0.16 a	0.22.3a	0.17 a	0.2 a
delta-BHC	9000	Yen	0.02 a	0.028 a	0.0113a	0.028 a		0.023 3a	2002	0.0051 NJ	0.0-48 a	0.00014	0.04 a		0.0463a	0.023 Ja	
Deldnn	0 00 5	You	120a	1004	14DJa	1.2 a	1D3a	1.1DJa	125460	0.43DJa	0.8838	0.96 a	1.0	12 a	0.533a	0.91 a	1.0
Endosulfan 1		No.			0.01	0.043 J	0.026 J	0.23 3	28486	0.026 NJ			11.05-23.11		0.026 3		
Endosulfan II		25			10 miles 12	0.43	0.24.3	0.54 DJ		0.18 DJ	0.83.0	0.02233	2005/17/2	0.23		1.4	11 57 11
Endosulfan sulfate		To The				*11.11	0.074 J	1000	3.6	17.24074	0.46	1000		0.35 3			
Endnin	2	YEA			11.202.0	0.39 1	0.14 3	0.23 3	17.	17:14:71	0.10	0.16.3	0.1	0.32 1	700	0.11.3	0.11.3
Endrin aldehyde		727		0.75	1-5	0.019	0.37 03	0.3 DJ	7.0	0.19 N	0.23	-	0.27.3	98.6	0.223	1.50	10.00
Endrin ketone		Ze Ze	1.20	1.50	1176	1.2	0.65.3	0.860	77	0.51 DJ	0.3	0.33 3	0.23	290	0.543	0.35	0.65 J
garmna-BHC (Lindane)	0.2	Yor	0.05 )	0.042 3	0.027	0.038 3	0.013 1	0.05	177	0.0153	0.016 3	T	0.011.3	H GAS	0.015 3	0.017.3	0.018 3
gamma-CHordane	~	Z,		0.00	7.11	0.0273	0.083	0.13	0.5440	0.083		145 Per 19	11.53.4	0.690	0.0613	0.07 3	0.093 3
Heptachlor	6.0	No.	5.100	10.10	2100	0.00000	4. TOO.	200	2.5	0,0076.3	0.120	0.75	748.11	0.000	7.75	5	1.20
Heptachlor eposide		No.		0.017	CONTRA	3 -475-1	0.02 3	0.123	1997	0.072.3	3.516	11 mary 11 mar	00035000	0.15 3		11.5 € 11.	0.50
Methoxydrior		You	1947	210	0.11	(6.00)	0.0713	0.34 3	97	0.22 3	101210		36,630		0.000	7,11.1	00712
Toxaphene	m	127	103a	25DJa	13 а	18 a	9.8DJa		97.		203a	26 a	2538	243a	26 a	20.0	27.18
Total Pestades		HOL	12 7506	28.8742	15.288	21.922	13.145	5 1322		2,3655	22.397	27.749	27.024	27.44	28.383	21 8901	29.453
Metals																	
Oromum	100	707	177		1.0	77.7	77	17.	3000	27.1	1.4		110.30	2111	(0)	2.9.1	77
pear	5	You	1000	5547	EWS	37.75	1800		100110				100				



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	n 2003 to 2014Q	4
	m 200	or MW-1
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Appendix	r Resu	peticides and Metals for
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	Groun	Dactir
	storical Gre	

	Sample Location:		MW-14	MW-14	MW-14	MW-14	MW-14	MW-14	NW-14	MW-14	MW-14	MW-14 03/16/2010	MW-14 12/01/2010	MW-14 12/01/2010	MW-14 12/06/2011	NW-14 12/06/2011	MW-14 12/11/2012	MW-14 06/19/2013	MW-14 09/04/2013	NW-14 12/12/2013	MW-14 03/25/2014
	Semp		N	N	z	z	z	z	z	£	z	£	z	£	z	æ	z	z	z	z	z
Analyte	KG	OBIES																			
44,000	0.1	Von	0.2.0	0.000	0.061	0.00.0	0.02 01	0.004 3	KA	MA	0.0059 3	0.013 3	0.13.0	0.134	D-52070	0.025.0	0.025.0	0.025.0	0.650.0	0.002 3	0.0012
4.4° DOE	0.1	700	070	0.04.0	0.000	9.0244	0.02.01	0.020	11.3	47	0.01342	0.011.0	0.13.0	0.130	0.0123	0.013 3	0.670.0	0.625.0	0.628.0	0.025.0	0.025 U
4.4°-DOT	0.1	No.	010	0.04.0	0.041.0	0.02.0	0.02.03	0.020	11.4	47	0.043.0	0.041.0	0.13 U	0.13.0	0.025 U	0.025 U	0.025.0	0.525 U	0.025.0	0.025.0	0.025 U
Aldrin	0.002	Non	010	0.02 U	0.02 U	0.6600.0	0.01 UJ	0.010	113	MA	0.0021 NJa	0.012.18	0.01 UJ	0.01 UJ	0.000.0	0.002.0	0.002 U	0.002 U	0.002 U	0 000 n	0.002 U
alpha-BHC	0.006	1/bd	2.4Da	1.8 D.s	1.9 Da	34.8	2.6 3 a	1.8 D.a	11.7	10.0	1.10.	1.30a	1.6 a	1.7 a	0.87 a	0.92 a	0.47 a	0.21 a	0.11 .	0.15 a	0.2 .
alpha Chlordane	2	MA	010	0.02.0	0.02.0	U 9000 0	0.0100	0.000	11.4	4.1	0.022.0	0.023.0	0.13 U.1	0.1349	0.570.0	0.025.0	0.025.0	0.025 U	0.052.0	0.0520.0	0.02510
beta BHC	0.02	1/00	0.54 a	0.61Da	0.67 D.a	144.0	0.7234	0.63 D.a	N.A.	15.8	0.49 D a	0.59 D a	0.68 .	0.74 a	0.4 .	0.39 .	0.23s	0.093 *	0.046	0.064 a	0.086
delta-BHC	9000	No.	0.48 a	0.5 D.a	0.54 D3 a	0.94 a	0.6938	0.64Da	NA	2.3	0.34Da	0.38 Da	0.59 a	0.62 a	0.34 a	0.35 a	0.15 a	0.065 A	0.036 A	0.048 A	0.066 a
Dieldrin	0.002	Vbd	0.70	0.012 3 a	0.017 Ja	0.03.11	0.00113	0.016 Ja	NA	V*1	0.017 a	0,024 a	0.019 3a	0.02 3 a	D.018 a	0.02 a	0.011 .	0.0078 a	0.0054 A	0.0059 a	0.0055
Endowulfan I		Mg/L	010	0.02(1)	0.02.0	0.0000	0.03 (1)	0.1010	712	4.5	0.002.0	0.021.0	0.110	0.151.0	0.870.0	0.024.0	0.620.0	0.028.0	0.970.0	0.025.0	0.025.1
Endosvílan II		NO/L	010	0.400	0.041.0	0.02 U	0.016.3	0.02.0	MA	45	0.043.0	00110	0.13 U.J	0.13 UJ	0.0061.3	0.003 NJ	0.025 U	0.025 U	0.00343	D 570 D	0.025 U
Endosultan sulfate		Mpd	0.11	0.040	0.041 U	0.02 U	D 02 U3	0.0083	MA	4 2	0.0023 3	0.023 NJ	0.13 u	0.13 U	0.025.0	0.025.0	0.025 U	0.025 ()	0.025 13	0.0050	0.025 to
Endrin	2	MAY	0.20	0.96.0	0.041.0	0.02 U	5.02.02	0.0061 J	14.5	2.70	0.0057 3	0.0012 NJ	0.010	0.1514	0.02513	0.0113	0.025 UT	115004	0.025.0	0.555.0	0.025 12
Endrin aldehyde		Apu	0.24	0.04.0	0.041.0	2.02.11	0.07.00	0.02.3	NA	42.77	0.043.0	0.011	0.13.0	0.140	0.025.03	0.025 0.0	0.655.0	0.02511	0.025.0	0.557.0	0.035.00
Endrin ketone		NO/L	020	0.040	0.041.0	0.02 U	C 02 U3	0.02.0	HA	47	0.0013 3	0.00093 NJ	0.13 U	0.13 U	0.00953	0.025 U	0.025.0	0.025.0	0.0016 3	0.005.0	0.025 UI
gamma-BHC (Undane)	0.2	764	010	0.02 U	0.02.0	0.0099 U	0.01.00	0.0039 3	WA	1 2	0.02211	0.021	0.010	0.13 U	0.02 U	0.02.0	0.02 th	0.02.0	0.01 11	0.000	0.02 11
gamma-Chlordane	7	MgA	0.10	0.05 0	0.00	0.003911	0.022 3	0.0313	N.N	144	0.003 NJ	0.0063 3	0.13.0	0.13.0	0.800.0	0.02517	0.655.0	0.02511	0.025.11	0.2250	0.0254
Heptachlor	9.0	MOA	0.10	0.70.0	0.02.0	0.002491.0	0.01.00	0.010	NN	77.	0.027.0	0.021	0.11(0)	0.1403	0.02511	0.672.0	0.629.0	0.820.0	0.078.0	0.477.0	0.072.0
Heptachlor epoxide		Ng4	010	0.02.0	0.02 U	0.0009	0.01.00	0.100	NA	1,14	0.022.0	0 021 ∪	0.13 U	0.13.0	0.025.0	0.025 U	0.625.0	0.025 U	0.025.0	0.725.0	0.025.0
Methaxychlor		MgA	22	0.2 U	0.2.0	0.690.0	0.1.03	0.10	11.3	MM	0.22 0	0.11.0	0.51 U	0.51 U	010	0.10	0.10	010	010	0.1.03	010
Toxaphene		MQ/L	10/01	11.7.11	2.0	0.8840	1.03	1.0	14.5	1774	110	1.0	136	13.61	0.250	0.25 ()	0.25 0.3	0.25 (1	0.25 U	0.75.0	0.35.11
Iotal Pestodes		MyA	3.42	2.922	3.188	5.14	4.048	3.308	HA	N.O.	1.9673	2.55043	2.889	3.08	1.6556	1,707	0.831	0.3758	0.2044	0.2699	0.3587
Metals																			I		
Chromlum	100	1/6rl	NA	14.8	MA	4.8	24.A.	NA	10.01	10.01	14.3	NA	20	20	2.0	5.0	20	2	HA.	5	N.A.
pear	57	Mg/L	34.4	NA	NA	NA	11.8	NA	1.63	313	TiA	10A	10.0	10 U	9.6 U	3.0	10.0	11.4	153	10 0	14.4



# 100

Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-15

### ### ### ### ### ### ### ### ### ##	į	Sample Location: Sample Date: Sample Type:	nple Location: Sample Date: Sample Type:	MW-15 08/21/2003 N	MM-15 09/10/2094 N	MW-15 11/15/2005 N	MW-15 12/13/2006 N	MW 15 12/04/2007 N	MW-15 12/03/2008 N	MW-15 12/09/2009 N	MW-15 03/17/2010 N	MW-15 11/30/2010	MW-15 12/01/2011	5 012	2 213	2 %	5 013	MW-15 03/25/2014
44°CDC    10,	Pesticides	RG	Units							ă l				z	z	z	z	z
4+CDC    01   144   120   12	4,4'-000	0.1	Yen	30211	4.60.0	1,5100	11.62.51											
44-titory   0.1   sight   si	4,4°00€	0.1	Yen	0.00		0.0005.1	1000		0.001	7	10401	11,800	0.020.0	0.026.0	0.830	0.02511	175,000	0.025.1
449 Agrin         0.002         µg/L         Image: Probability of the probab	4,4°DDT	0.1	Trait		1000	0.14 a				10		0.620.0	5 87 5	0.000		10.30	20 27 21 6	200
Apple   Column   Co	Aldrin	0.002	You	ord Species	0.000	1 307				100	1	11.4.4.11.0	0.14	471.17			0.025,110	
Public Classified   2   10pt   100000000000000000000000000000000000	alphaBHC	0000	Veri	101		10000000				4		0.01606.13.345	10 CO (C) 11 C)		1.000	5	31. 36. 3	TOOLS IN
Peta-Birt   0.02   Light   Light   Dudoza   Light	alpha-Chordane	2	1/2/1			C. Christian					110000	2000	11.4	1110000	1,000	*** )	Trees.	
Decimination   0.000   Light   Decimination   Dec	beta-BHC	0.02	1/0/1			1 0000			-	÷ .								
Deletion         0.002 upt         upt         0.0029 a         upp	deta-BHC	9000	You	11.2		1 1000		000000000000000000000000000000000000000	0.028 a				0,0041 3	3000				
Endeatfant I         pgt         bit         pgt         bit         bit <t< td=""><td>Dieldrin</td><td>0.002</td><td></td><td>0.002838</td><td></td><td></td><td></td><td>The state of the s</td><td>116.23</td><td></td><td>4 MOS</td><td>100</td><td>1782</td><td>11130</td><td>11 65 1</td><td>0.04</td><td>100000</td><td>100</td></t<>	Dieldrin	0.002		0.002838				The state of the s	116.23		4 MOS	100	1782	11130	11 65 1	0.04	100000	100
Contained   Light	Endosulfan I			0.0130					Makes 14	进	0.00023 Ja	0.0023 3 a	0.0003 a	0.0019 3	100	0.00023 a	0.00123	0.00
Charlet sulfige         Light         Light         Charlet sulfige         <	Endosulfan II		124	0.00				1000		9		0.400						
Endin   2   Light	Endosulfan sulfate		101			2000		5000				0001+000			1	11000		
Option districted         Light         Institute         Light         Institute         Institute <t< td=""><td>Endm</td><td>2</td><td>You</td><td>100</td><td>200900</td><td></td><td></td><td></td><td></td><td>ś</td><td></td><td>0,000</td><td>10000</td><td>1000</td><td>1 10 11</td><td>1 22 0</td><td>0.00143</td><td></td></t<>	Endm	2	You	100	200900					ś		0,000	10000	1000	1 10 11	1 22 0	0.00143	
Descriptive condition   Light   Goods   Light   Ligh	Endrin aldehyde		Y			0.000,000							0.0000	200	1 200	1.174.17		116/16/2
### ### ### ### ### ### ### ### ### ##	Endrin ketone			0.0058 3						7		1,0264	(0)2425/00			+ 5000		
Page Cardinal   Page Cardina	Jamma-BHC (undane)			100		. 004		TOTAL CO.		\$ 1		3 370 5	50000000	0.00	1.5700	-	1000	0.0029 3
Helpethor 04 Lg/L  Helpethor open de Lg/L	gamma-Orlordane	5	You	10.00		100				5 1		1		20,000	1000			1,04
1	Heptachlor	0.4	Z.			1 3018				H 10			4.170	1.4	11 (12 )	0.000	340 E	11.44
Touchere   1 July	Heptachlor epoxide		122	0.7000	A. 35 ft	1000										0.025		
Toughere 3 Lag. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Methorychlor		Yer	9830000		1. 14. 14.						0.02	7.9	1.44	J. 57 11.11	0.0200		0.000
Chromium         100         LgAL         0.006         0.1675         0.03         0.037         14         0.003         0.0073         0.0073         0.0014         0.0023         0.0023         0.0033         0.0033         0.0014         0.0023         0.0033         0.0034         0.0014         0.0033         0.0034         0.0014         0.0023         0.0035         0.0034         0.0014         0.0033         0.0034	Toxaphene	m	You	0.000	30.07	0.560							140			12.12	0.0000	
Chromium 100 μg/L μs μμ μπ μπ μπ μπ μπ μπ μπ μπ ππ 25.3 4.83 μg/L μπ μπ 12 μg/L μπ	Total Pesticides		Non	0.0086		0.1675		0.03	0 00 0		1		308(0)	1.00		1.		
100 jugit 155 op 16 feb 100 feb 150 fe								200	0.00337	-	0.0023	0.0023	0.0071	6100.0	0.0014	0.0023	0.0026	620000
15 ppt rat has rat rat on the Stl 2.55 4.80 rat 21	Chromium	100	HAY	:[	n,	1,4	1772	174	6.2	110								
	Lead	15	You	7	17.	*	1.2	47.3			ď.		2.5.3	4.8 3	147	554	21	₩,



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-16

	Sample Locations Sample Date: Sample Type:	ations Date: (	MW-16 08/21/2003 N	MW-16 09/10/2004 N	MM-16 11/16/2005 N	MM-16 12/13/2006 N	MW-15 12/04/2007 N	MW-16 12/03/2008 N	MW-16 03/17/2010 N	MW-16 12/09/2009 N	MM-16 12/01/2010 N	MW-16 12/06/2011 N	MM-16 12/10/2012 N	MW-16 06/19/2013 1 N	MW-16 09,05/2013 N	MW-16 12/12/2013 N	MW-16 03/25/2014 N
Analyte	RG	Units			27												I
Pesticides								11000	VC-8-13	512	1,000,0	0.035.0	0.6350	0.02513	0.025	0.52.0	0.0036 3
4,4"000	0.1	York	42,500.0	0.02.71	0.0275	0.42.03	0.00	0.1210			0.00	115000	-19270	1.000	+ 1005 (+	1022	3,625.43
4,4'DDE	0.1	Yen	0.00823		11.11		0.014 3	0.10	200	1 9		17.4		C 35.10		STERRE	0.020%
4,4:001	0.1	You	C 7				0.026 J	0.012.)	77				1000	11.00	1570016	MASSES.	Charles for
Adm	0.002	You		2	7.1.			CHCLICA		1	000001		C. Lake 1	A 100 MILES	0.90	0.1 a	1000
alpha-BHC	9000	hay	11.0		1.65	10000	20.000	11100	0000	1 .	- Common	1 20 10 1	0.00253	0.025 0	0.0035 7	12570	10.54
alpha Orlordane	2	DQ/	0.165	0.1800	(100001)	0.0123	W.702.5E	0.011.0	0.00030	1 :	0000	1 6100	0000	0.000	(T. 7) C	0.15.10	0.015 J
bets-BHC	0.02	NO.	0.078 a	0.0813a	0.0493a	0.037 3 a	0.0343a	0.038 3 a	0.037.38	1	0.027.38	0.010.0	a section	17.4.11	0.000	в 680'0	0.000,000
delta-BHC	9000	170rt	0.91	(15110)	0.000		1000	11111111	11.00		7.000	0.70	0.66 a	0.61 a	e 790	0.62 a	0.6 a
Dieldrin	0.002	Yor	0.43Da	0.62Da	0.47 DJa	0.47 Ja	0.543a	0.34 D a	03178	1			115,000	11 20 11	11250	125	0.000
Fredoutian I		Yay	1,993.4	0.03101	1,3776	1,024,7	10.00	2 1100	000033	1				1,60000		(0.2.20)	100000
Endosulfan II		Yes	10.00	10.00		0.0143	0.036 3	90.0	0.4.1	9 9	1,000		0.023 3	7) - 1	0.016 3	0.5230	110000
Endosulfan sulfate		187	27	7.7	7-1	3570	0.0123	0.02000	0.0042.5	1	5000	LBIOO	11.0	0.0293			1.024.1
Endrin	~	VEN		11.4.1.1		0.026 3	0.013 3	1,00	†	1 1		1000	0.00%310	0.0333	0.425	0	1025.04
Endin aldehyda		L/B/L			Orași D	0.035 1	0.028 3	0.0123		3 5	1 2000	5000	0.019 3	0.0193	0.023 3	0.0363	0.017 3
Endrin ketone		VSV.	0.044	0.063 3	0.039 J	0.025 J	0.028 3	0.022	0.0143	4 !	0.037.5	2	0.000		1.00.3		116211
gamma-BHC (Lindane)	0.2	Von		7.00	0.000	11	1.11.12	2000		4	110000	10.006480	1000	10.00	0.0063 J	1.5.1	
garrms-Chordane	7	hav	0.567	2.00	1000						COLUMN TO SERVICE	0.0751		10000		1 4 7	NAPETON O
Heptachlor	0.4	Hay	- 5	4.00	A STATE OF	7110	47 [54	The second	10100	1 0	0000	0.043	0.034	0.16	0.033	0.043	0.028
Heptachlor eponde		Med	0.0273	0,051 J	0.033	0.029 J	0.031 3	0.025	661000					0.0073 3		0.143	45.50
Methorydilor		Nor	- 2 -	7.	- 7						Net	37.8	2.8 J	1.5	0.5	1.6.3	1.01
Toxaphene	m	Yerr		- 4	7 *	1.13	E				3 8 168	4 535	35715	2.3612	0.7518	273	0.5636
Total Pesticides		You	0.5872	0.815	0.591	1.736	0.762	050	0.5721								
Atetals									41.0	-	Ü	7.6	0.5	AL1	1.4	0.5	MA
Chromium	100	YEN	177	5.04	1,44	980	ı <u>t</u>	1			11.04	1511	035500	1171	4-1	15.61	-14
Lead	13	Var.	7,4	15	177	345	145	**	100								



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Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-17

N		Sample L Samp	Sample Location: Sample Date:	MW-17 08/21/2003	MW-17 05/09/2004	MM-17 11/17/2005	MM-17 12/12/2006	MW-17 12/06/2007	MW-17 12/04/2008	MW-17 12/10/2009	MW-17 03/18/2010	MW-17 11/30/2010	MW-17 12/02/2011	MW-17 12/11/2012	MW-17 06/19/2013	MW-17	MW-17 MW-17	MW-17
44.000   11   144	Annahan	Sami	ole Type:	z	z	z	z	z	z		z		z	z	z	N	N N	N N
4/COCO         0.1         jg/l         0.0         1.0         0.0	Pesticides	004	OHES										Total Control					
4 COC   0.1   ppt   1	4,4"-000	0.1	had	2012/01/20	1930	110464	11.27%	A 360	277.1	27.								
44-CDT   0.1   pat,	4,4°DDE	0.1	ž	100				J		1				0.00	115.5		11 20 2	17576
Adding         0.002         jgt,         100         1	4,4-DOT	0.1	3											1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3,797.6		12.57	
	Aldrin	0.002	You		352100		A CONTRACTOR								0.001			
	alpha-8HC	9000	100		ON OTHER	56600	31.00.00	100000		1					100000	1000	0.5000	0.000
best-Brc         0.00         up/L         Free Brc         0.00         up/L         Free Brc         Processor	alpha-Chlordane	77	757		10.1	0.000	0.09099	36046036							0.00		6.935	09/00/83
	beta-B+C	0.00	787		1	0.0074	1000000		1 000						10000		1.50	0.0020
Designe   Coop   Log   A	delta-BHC	90000	72		1	711												1127
Endoatlant I         upt         county         coun	Dieldrin	0.002	You	11.45	6		0					CONTRACTOR OF THE	COLUMN STATE					111111111111111111111111111111111111111
Excitation   Light	Endosulfan I		YEN		14000	Service .		11 17 18		4			OF STREET	0.0013	1000			
dealer sulfage         p.p.k.         control of part	Endosulfan II		YEN			or other	1	0.002 1		4			1000000	OFFICE OF STREET			1	
Finding   2   Light	Endosulfan sulfate		No.	90000	(0.00)		0.7000						ALCOHOLD STATE		0.00000			
right states         upt         Fig. 1         Control of the control of th	Endrin	64	York			0.01000	1 0 - 1	1 1111										
Explicit record   Light   Color   Co	Endrin aldehyde		York	0.000		000 GL030	10000		9000					1				
	End in Fettine		Yen		0,000		11000	NOOR STREET										(600%)
Principal content   2   Light   101   10	gamma-BHC (Lindane)		Yen	10000	7		1000	September		100							119011	260
Hegostor 04 upt	gamma-Chordane	7	Non		1	0.00			100									1001
positive spoode         up/L         tri         cost	Heptachlor	0.4	nah			1. 1.1.2.	10000						0.00110000	4			-	
Nethbordior         ug/L         total control of the c	Heptachlor eposide		Agri		0.00	0.000	1000			1			20124250	0.0				
Total Peacles         3         LgA,         FULL PLAN         CF. Co.         CF. Co. <th< td=""><td>Methorydrior</td><td></td><td>LIGA.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0000000</td><td></td><td></td><td></td><td></td></th<>	Methorydrior		LIGA.											0000000				
Octobrished by         Log /	Toxaphene	m	You	7	0.633	8	0.05									00000	26442	
Overnum 100 µg/k ha	Total Pesticides		Por.			111				17			4.	0.50	0.80	0.55.0	0.36 0	0.25
100 104 146 146 147 147 147 147 147 147 147 147 147 147	Metals		181			300	2000	27770	0.02	777	- 1		-	0.0013		Altr.	9	10
15 uppl. 14 to 15 to 15 to 16	Chromum	100	YEM	77	4.	4.	1981	272	=2	11/2	47	1	0.4					
	Lead	15	No.	1,1	-1	d	4	-	12	110	0.5		6.0	91	+	7 .	21	(3/10)



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-18

	Sample Location	cation	MM-19	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW- 18	MW-18	MW-18			MW-13	MW-18	
	Samp	e Date:	Sample Date: 08/21/203	09/09/2004	11/17/2005	12/12/2006	12/06/2007	12/04/2008	12/10/2009	03/18/2010	12/01/2010	12/02/2011	012	013	09/02/2013	12/12/2013	8
	Samp	Sample Type:	z	z	z	z	z	z	z	z	z	z	z	z	z	z	z
Analyte	RG	Units				1											I
Pesticides																3	115,000
4.4'-000	0.1	you	(1H)	0.250	0.046 3	11.00	17 37 0	0.0004	57	0.00000	0.070.00	1					
4 4'-DOF	0 1	You	0.002	0.0213	0.0143	0.000	\$1-36 m	16352 651	77	0.00123	11000	10 Colo 10 Col	110000				
44:001	ć	you	118	11304	0.0243	0.000	0.70	0.039	510	104.00	0.00046.3	4.770	0.0022 3	5	277	S.	
200	coop	You	Annual area	0.013 a	11.00	110000		11/2 1/200	14	0,002138	0.6250	0.00	0.00413a	1,114	11.4	10 OC 10	3.143.00033
	7000	1		0.036 a	0.012 a	30000000	24-24-16	- C1111	44	0.0039 3	0.8641	0.000	21.46.11	0.000	1.8	71.30% D	0.644.1
approprie	9000	Total Control	0113	011	0.038 1	0.034.3	0.0153	0.029 3	47	00000	0.011.3	0.0113	0.011.3	0.0000	0.01	0.0099 3	0.0088 3
apria Circles		1	AL 191		0.33 D a	0.08428	0.056 3 a	0.11 a	47	0.17 DJa	0.014 3	0.037 a	0.12 a	0.15 a	0.13 a	0.098 a	0.11 a
200	9000	1	20000	0.011.4	0.0051	11400411	0.01.02	17840717	1/1	10(6(0))	0.00011	0.000,10	E00682.03	0.0000	0.086.0	139,60	1310000
Colden Colden	000	No.	0.58 a		0.18 a	0.051 a	0.02 3 a	0.031 a	11	0.028 3 a	0.00753a	0.0092 a	0.014 a	0.012 a	0.012 a	0.012 a	0.011 a
	7000	1	2	11000	T. S. N. S. I.	N 409411	10.00.00	0.00153	74	0.00113	11/24/004	1150000	0.0076.00	115501	13/10/0	0.0750	15717
Tugografian 1		ž.					1,000	1 20000	300	0.0048 3	1,42,040	0.00093	0.00	0.000	0.0033	1757	0.0021 3
Endostutan II		ž.	ī						2000	The same		0.00123	0.0027 3	0.5160		1727	- 17
Endosulfan sulfate		ž						The second second					17 1 0 10	0.0058 3		150	100000
Endrin	2	787	1 7									. !		11.5.17		110 % 111	0.00
Endrin aldehyde		Mari	SOME	0.000		0.0197	665.03	0.017.3	1		7 0 10				00000	0.0000	0.0000
Endrin ketone		YEA	0.37	0.26	0.13 3	0.0193	0.0113	0.019 3	of 1	0.023	0,0022 3	100	0.00713	0.0068	0.000/	0.0000	r comm
damma-BHC (Lindane)	0.2	You	0.133	0.059 J	0.022 3	The section	0.144	0,0035 3	-1	0.00043		585	00002110	-	0.0011.5	0.0012.7	
garma-Chordane		Very 1	0.0753	0.094	0.0433	0.0253	0.012.3	0.027 3	177	0.023	0.00943	0.0096 J	0.011.3	0.0062 3	0.0089 J	0013	0.0082 J
Heptachlor	0.4	1,00			1000	Officer to	11-11-1	0.0114	14.77	(F) (F) (**)		0.0000000	74.0 E 34.0				
Henzachi or encode		YDO	0.035 J		1. 1.744		D 16.3	2110		11.7	2.426	1,125	17				
Methodothor		You		-		11.025	((040))	10,000	3.275	0.00943	0.0027 1	7.1.		0.0075 J	0,0027 J		
Toxarbane	e	You	1.33	2.1	0.980	0.593	11.3	174.64	381	11 11	0.7613	D W	0263	0.22.3	0.31	5 4 5 5	
Total Pesticides		NA.	3,642	4504	0.844	0.822	0.147	0.2856	177	0.2645	0.0514	0.0739	0.4321	0.4083	0.4844	0.1367	0.145
Metals																	
Chromum	100	YEA	1/4	44	1,4	77-	10	1	6.93	5	13	9.5	2.6	777	4.6	20	184
lead	15	Vor.	1.26	55	979	51.	45	7		1/1	3.33	10.0	Post	116	45	10.00	. 14



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-20

	Semp	Semple Date: Semple Type:	Sample Date: 08/20/2003 Sample Type: N	09/08/2004 N	11/16/2005 N	12/12/2006 N	12/06/2007	12/03/2008	MW-20 12/10/2009	63	12	MW-20 12/06/2011	MW-20 12/12/2012	MW-20 06/20/2013	MW-20 09/04/2013	7 73	MW-20 03/25/2014
Analyte	RG	Units					:			z	z	z	z	z	z	z	z
Pesticides														I			
4,4:000	0.1	You	1 7 1	1070	0.859	11650	0.02403	0.00	28.00							0.00	
4,4'DDE	0.1	VEN					1,0100					4	1,520,0	1111111	10.97	15 10 10	10,000
4,4'DDT	0.1	757								1		0.022 )		10.00	17-4-17-16		100
Aldrin	0.002	York	0.850			140000			E)		-1		1.5	CO. 177000	0.000		0.005 3
alpha-B-K	0000	York	2.8Da	59Da	63Da	THE SALE	2.000	470.			The state of			170071	0.0073 3 a	116000	1 (10)
alpha-Chlordane	cu	75	L. V.	0.110	200	- ALCOHAL	1000	4109		5,2DJa	4.6 a	3 a	1.9 a	1.4 0	1.1 a	1.1 8	1.1 0
beta-BHC	0.02	1,01	0.34 a	140	14 a	26.4	26030	- 00	1000			1	9.000	0.00213	10.25	15/2/10	0.050
delta-BHC	9000	VEH	0.49 a	1.6 a	1539	200.00	2010	150.		1000	2.3 a	1.93a	1.1 0	0.85 a	0.67 a	e 9970	0.6 a
Diddnin	0.002	Veri		- 100	100000	0.018 3 a	0.025.1a	200		Lobbia	1,4 8	0.84 8	0.61 a	0.44 a	0.35 a	0.39 a	0.4 a
Endosulfan I		Yor	100400	3830	1000		11111111				DY 1-19	and/ a	acts a	0.000 a	0.032 a	0.025 a	0.024 8
Endosulfan II		N		11720	100000000000000000000000000000000000000										0.7	1 M 10	11/2011
Endosulian sulfate		You	1 1 6	-	0.65.0				(() e			0016	0.008 3		0.00613	0.0065 3	0.0052 3
Endrin	24	Š	0.1.1	17.72					4 5			-	1000		311 2001	10000	W 15
Endrin aldehyde		Val.	1.1	-							7	0.00	100	0.012 3	11.00	10/20/00	200
End in ketone		Yes	2019/2015		10.5					0.013 )		0.03	1.000	11,400	1.7.7		
camma-BFC (Undane)	0.2	You		1.000.0	00000		0.1.5		1	0,016.3			1 4 11	100000000		10.00	
gamma-Chlordane	~	You		-	Coton	0.0003		0.038	ıl .	0.11.3	0.18.3	0.062 3	0.024	0,03	0.019 3	0.029 3	0.0033 3
Heptachier	40	YEN					10100					1.67	0.00243			- 4	1 10 111
Heptadilor eposide		roy	1.4	110			6 7100					7 4 4	0.05 4	0.77		2000	(0.200)
Methoworlor		You	Of the Section						Į.		100 miles	1000	111 × 111	0.00060	115310	1.6	7 (
Toxaphene	്ന	You	11/3							54-46			0.14	1	215		4
Total Pesticides	ē.	700	260	0000	4								- 4	0.00	0.53 J	0.35 J	
Aketals		P.	2000	2220	3.643	186	12,368	8.238	2	6896	8527	5.987	3.6804	2,7727	2.7144	2.5605	2.1375
Oromum	100	YEN	171	172	111	10,	12.	200	17.5	-				ı			
Lead	15	You	*	2	111	7	2500	WEST	17.				2.6.1	4	#	223	*5



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-21

	Sample Location:		MW-21	MM-21	MW-21	MW-21	MW-21	MW-21 12/03/2008	MW-21 12/10/2009	MW-21 03/18/2010	MW-21 12/01/2010	MW-21 12/06/2011	MW-21 12/11/2012	21	MW-21 09/04/2013	MW-21 12/12/2013	MW-21 03/24/2014
	Sample	Sample Date:	us/20/2003 N	No. No.	N N		z	z	z	z	z	z	z	z	z	z	z
Analyte	RG	Units							0								
Presticides											11 7000	11000	1,610,0	0.036.1	11.57.11	0.00000	0.00076 3
44.000	0.1	May	13,552.1	11.00	116.45)	(60220)	0.050	0.025 3	1	0.024 )			2000		11000000	1,000	E ASH II
44,006	c	N CO	17.7	0.0643	0.31531	10/2/2019/0		0.069 3	127	0.5424	1000	1000	0.063	77070		2000	1 0000
44.001			100	11.00	0.0243	A16/02/20	100 PM	P. tour	15	0.017 3	0.055.00	-0.550m	0.0123	0.016 J		0.012.5	000137
100-4,4		1	- 5000	100000		1111111	1011111	0.018 3.8	15	0.014 a	0.01438	0.056 a	A10000 Jan	0.029 a	D. Took	The state of	1 (4, 7, 1)
Aldnn	2000	ž.	O'CLEGO &	- 0000	- 1000	110177	at 700	0.073 a	177	0.07838	0.065 a	0.00	0.096 a	0.05 a	0,014 a	0.038 a	0.022 8
apha BHC	9000	761	0,056 a	n'noo a	O.O.		000113	0.0034	1	9000	0.030.0	0.02519	0.000	102501	0.0032 3	0.0063 3	0.00483
alpha-Chlordane	C+	764	0.020	D. H. C.	1000000		0,000	- 0000	1000		0.17 a	0.52 a	0.52 a	0.25 a	0.12 a	0.11 a	0.12 a
beta-BHC	0.02	764	0.32Da	0.32 D a	0.26 D a	0.019	0.37.Ja	0.2408	i	0000	0.0054		0.084 a	0.031 3a	0.008238	Undown	0.01338
delta-BFC	9000	V6ri	0.017 38	0.033 8	0.051 a	00100	0.046 Ja	0.05 a	3	0.044 a	e remo			0 13 0	0000	10000000	0.13 a
Deldrin	0.002	You	6,075.04	0.18 a	02 a	0.018 3 a	0.0413a	0.15 a	4	0.14 a	0.13 ) a	0.1438	0.14 d	0.13 a	0.00	10000	1 30000
Endow dies !		You	6,005111	11.11.11	1 95 31 11	(1152)		0.032.0	5	0.014NJ	0.0091 3	0.024 J	1 1 1	0.024 5	0.0000000		1
T. C.		1	1000	0.00	0.000000	291282002	0.026 J	0.086	3	0.1510	14.00		5.00	100	1000		
Endosultan II		100		0.000	100000000000000000000000000000000000000		111111111111111111111111111111111111111	-	77	111111111	0.00 th	10 TO 10	0.02.0	0.045	10.5.11	0.00	
Endosulian suitate		Š	176000	0.000				19100	11.1	0.03	0.0008 3	111 2 112	0.016 3	112210	1, 6, 1,	0.00673	0.00933
Endin	2	you	17110	1,000	6.51			60100			175.70	0000000	11 30 3 11	0.0097 3	799	0.000	0.025 1
Endrin aldehyde		You	0.044.1	11.02.3		11.75	0.011 J			-	9.0	97.0	100	0.13	0.058	0.13	0.083 J
Endrin ketone		YOU	0.41	0.38 DJ	0.28	0.029 3	0.34.3	0.24	100	0.25	613	200	7		1 5100	0.018.1	0.017.1
(andane)	0.2	You	0.072	0.077	0.061	0.01110	0.077 3	8200	14	0.048	0.04	0.24 Ja	0.11	5			
osmma-Chlordane		You		1.1	A -	0.6410	0.0711.1	0.013 J	14	0.0143	11.50	0.00098 3	1			and the second	THE STATE OF THE S
Hertrafile	0.4	You	0.0113	0.00763	0.000	0110	0.00(\$9.27)	15.141.51	7	0.00863	0.150.40	2000	100	O train	1100000		
the worlder provide		40.			0.00	5427-00	(M1000)	0,00333	3	25.00	11.20	10.50		0.0/1	1,02553		
Shared Company					0.000	1074		4 44 14	5	0.21 10		0.58	0.00035 3				GROOD
Methowychion		You		.0021120				-	177	1	0.85	43 a	4,6,19	0.63 NJ	89'0	1.2	2.5
Toxaphere	m	VOI				- 4		900	MA	1 1476	15301	6.0798	6.2265	1,5057	0.9274	1541	2.925
Total Pestidides		YOU	1.192	1.1276	0.92	9970	0.532	1.125		2011							
Motals							34 34 34 34			21+		114	4.7.3	11.1	25.	15	1.4
Chromium	100	YOH	#	-1	ď	7.	4	4	3.63	1004				214	ν	1.93	177
3	4	You	515	100	143	7.1	17	1.54	1300	125	35000	Octo					



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Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-22

	Sample		MW-22	MW-22	MW-22	MW-22	MW-22					MW-22	MW-22	MW-23	MAN, 33	246.33	50
	Sam		6002/02/80	09/08/2004	11/16/2005	12/13/2006	12/05/2007	12,	12/	03/17/2010	11/30/2010	-	12/12/2012	0		09/04/2013 12/12/2013	8
Analyte	BG	Sample Type:	z	z	z	z	z	z	z	z	z	z	z			z	z
Pesticides										1000		ın.					
4,4"000	0.1	You	0.76%	0.000	0.027.3	0.011.3	113, 117	0.00% 1	411	1,0100	1 00000		. 00.000				
4,4'DOE	0.1	You	100230		0.016 J	10.00		1 0100		0.0000	00000		0.0059		0.0062 J	0.0075 3	0.0092 J
4,4-DDT	0.1	You			1 9000	11.55,0161		1		0.0000	0.012.5	-		0.011 3	0.0257	0.0200	
Aldrin	0 000	1/0/	0.0009 1.0						2 (S		0.014 )	0.012 J	0.0096 J	TO COLUMN		CONTRACTOR	0.018 3
archa-BHC	0.006	700	10000	-				CONTRACTO							0.0043a	115000 511	0.0003 Ja
apha-Olordane	2	1 7		Ì		0.00643		10000	384	0.0000000000000000000000000000000000000	0.000	0.00	1 7 47	0.000	5361	1.000.1	0.0013 J
beta BHC	0.05	Yen	0.0113	0.018.7	1.6500.0	0.0078.1		0,000	4	00000		00000000		0.0028 3	0.002 3	0.0014.3	
Odta-Brc	0000	You	10.11.0						1		0.0008 3	0.0067 3	1000000	0.4554		0.0057 3	0.0052 3
Dakton	0,000	700	Contract of	0.000	00000	0.0000		100000000000000000000000000000000000000	70	0100000	0.00022.3	0.0000	0.0019 3	0.00173	199	1765	10001
Condens Man	*	1		DC 7000	0,007.78	0.027.38		0.028 a	4	0.025 3 a	0.0-t2.3 a	0.039 a	0.03 a	5,000	0.033 a	0.027 a	0.025 a
1 upungana		No.	0.000		20112	7.5.4		0.00071.3	7	0.0055 J				0.0005 J	A Charles	18800	
II usuntanu		72				0.017.3	0.018 3	0.028	77.	0.023	0.0017 NJ	0.80	25,20	11000	0.5500	10000000	11.00
chacturan surate		No.	5 6 6			2.50	11.00.50	0.014 )	1,10	0.00863	D-10-17	11 4 1 19	1.0	1. 2.1	100		10.000
Endnn	2	You	4000			0.0123	0.02003	0.016 3	78	0.0183		0.0143		A S	11100		
Endrin aldehyde		72	11. 14.17			0.013 3	0.02004	0.034 )	(44)	0.34	00000						0.0012.3
Endrin ketone		YA.		0.0143	0.01 3	10161		30100	877	0.00039.1	-	1040.0		0.0006.1	61000	1000	
garma-BHC (Lindane)	0.2	You		10.00	0.0015 3	11000	41.00		176	1111	110	0.0000000000000000000000000000000000000		Comon	0.000	0.00037	0.0034 J
gamma-Chlordane	rı	Y	2000	1000	1100	1,000		0.0051 3	27	1 0000			THE STATE OF THE S	The second of			
Heptachlor	0.4	70	0.0051 3		1000	0.000	The other	1111							0.0025	0.0032.3	
Heptachlor epoxide		You	0.315.0	37400	0.100	D. Wyker,	45 (61 4)1	0.0058.1	77.	100000	. 90000	1			0	a catalon	0.65 €
Methoxydrior		You	1.10	2,117	(8:111		1000	0000			C SOOOL	0.000		0.000	0.800	6.2.500	1102511
Toxaphene	(*)	707	0.93 3	1.6	-	-	11.1			rotton	CNECOOD	orono o	- 1		0.0113	0.110	0.0143
Total Pestodes		La.	1 002	1 694	1.1364	1 (79.47)	0.000	03100			7.7	5	11.	-	1.5	1.4	100
Metals						*****	0.005	0.4139	1.5	0.1237	1.1995	13772	1.1474	1.0215	15916	1 4485	0.0911
Oromum	100	You	77.1	777	\$1.1	177	¥1.	147	413	55	3.9.1	8.4	4.1	1	770		
Lead	15	YEN	7,47		157	9	47.						;				-
								-		1,944	2.6.3	330	4.7.3	16.5	1.4	1000	344



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-23

	County County		CC 1944 23	50.00	WW.TR	MW. 32	MW.33		MW-23	MW-23	MW-23	D. M.	3.44	MW-C2		2 44		67 1111		1	
	Sample Locali	Sample Date: 08/70/7003	- 6	٥	11/15/2005	11/15/2005	12/14/2006	90	12/00/2007	90	80		010	010	110	017	013	5102/50/50	E104/50/50	12/12/2013	4/24/2014
	Sample Type:				z	5	×	æ	z	z	£	z	z	z	z	z	z	z	2	•	
Analyte	RG Un	Units						01													
NOCS											111	1450	411	1111	0.18 J	m1	NA	HA	1.13	1.00	11.5
Benzene	2	MA/L NA	7.0	10	0.0	10	1.0	0.1	0	7.0	,	0 :					11.8	14.8	1.3	7.	7.13
Toluene	5	MA/L NA	2.7	10	10	0.0	2	10	7.1	1.0	2	0 2 0	4	B	3 :	1 :	5	97	41	-	14.5
Ethylbensene	ä	ug/L HA	0.1	10	0.1	10	2.	10	7.1	2.0	10	0 50	Z.A.	3	0	7.77	5	5 :		4 3	***
Market but buttel other	. 8	000 ha	100	30.0	10.0	100	MA	718	MA	NA.	PLA.	N.A.	MA	MA	Y)	NA.	NA.	\$	5	£ :	5 .
recording to the conditions	•		100	911	444	413	117	NA	MA	MA	15.8	3.13	MA	14.4	144	177	14.4	14.14	14.4	1/A	476
rii-Aykane	4				4 2		114	777	16.8	MA	417	0.5 €	NA	14.3	MA	19.8	41	7th	77.7	44	1,4
o Xylene	•	Mg/L NA	N. I.	11.44	4					-	7.6	0.80	A/I	101	10	10.	NA	19.4	NA	10	41A
Xylene (Total)	ā	POAL NA	6.7	7.0	20	6.7	7.11	7.0	2	0.7	24	260									
Pesticides													10000	40.00	119700	112000	0.025.13	U 255 U	0.00173	0.05 U	D 022 U
4/4-000	0.1 pc	USD App	0.000	0.000	0.040 0	0.000	0.02 U	0.2 C	0.0363	0.1338	0.11.18	5			10000	A 035 111	113000	115000	0.005.11	0.05 U	0.02514
44.000	0.1	U 20 U	U 0.04 U	0.56.0	0.042 U	0.22.0	0.02 13	0.00	0.0243	0.0313	0.0243	14	0.031.3	1000	0.000	0.000.00	1 20000	1 2000	112011	0.0%	0.025.0
4.4.007		USA CEL	U 0.04 U	0.05.0	0.042.0	0.000	0.046 3	0.200	0.023	0.0523	0.053 3	43	ONEZO.O	1.10	0.000	0.000	-		1 1000	A 1 3 1 1 2	0.000
Aldrin			0.79 3a	0.3438	0.1 a	0.062 a	0.06234	0.16 Ja	0.063 3 a	0.043 .	0.045 a	15	0.022 3a	2,230	0.0250	0.700 0	0.000.0	0.000	0.700.0		
100		•		0.1.0	0.71	0.31 a	0.0953a	0.17 3a	0.143a	0.12 a	0.13 a	451	30 KM (C)	2,938	0.0061.0	0.00610	0.006 U	7 900 0	D 00001 U	0.022.0	0000
appa-ord.				1 200	0.046.1	0.046.3	0.083	0.13	0.016 3	0.0423	0.043 3	10.0	0.073	1300	0.026 V	0.02510	0.0017 )	0.0023	0.0018 )	0.000	0.025.0
appea Chiorbane	2	100		22010	2203	2304	3.5 a	3.2 a	28D3a	LSDa	2.1 Da	515	0.8 DJa	- 40	0.11.0	0.07 a	0.083 a	0.15 a	0.14 a		0.054 a
DOM ON				H	0.2934	0.2534	0.2534	0.2334	0.2234	0.133.8	0.13 34	471	0.00723#	0.80	0.00143	0.0061.0	0.0016 3	0.0091)	0.00011	0.022.0	0.000
OGG GTC				ı	210.	25012	22.8	2.1.8	1.9 DJ a	13Da	1.5 D.s	VIV	0.002.03	1910	0.0029 .	0.0016 3	0.0018 J	0.0048 Ja	0.0034 3 a	0.026 a	0.0044
Chestorn	776E			0.0411	0.00411	0.0411	11100	010	0.0103	0.076.1	0.013 3	VIII	0.042.1	0.5.3	0.076.11	0.025.00	0.0027 3	0.035.0	0.00511	0.0511	110.2011
Fredoritan	•			10000	0.047.0	0.76	0.31.1	6123	0.081.3	0.19.1	0.2	9	0.0413	1.1.11	0.0113	115700	0.0019 3	0.03511	11500	0.00	115,500
Endocution II	4			2000		200	0.076	-	0.14.1	0.021.0	0.62111	11.0	0.54 53	0.89 3	0.026 U	0.0000	D 222 G	0.000.0	0.025 0	0.000	0.005512
Endosultan sultate	•		0.00		2 2	1 50	1 000	0.510	0.0133	0.0763	0.0813	1,44	0.02 NJ	130	0.026 U	0.02200	0.025 U	0.0023	0.00213	0.000	0.025 U
Endrin	4			0.000	2000	200	2 2000	6111	1210	0.25.3	0.021 U1	14.8	350	113 (1)	0.026 UI	0.025 U3	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U.
Endrin aldehyde	a				200				1.001	1.0	120	3	0.0133	7	0.026 U	0.025 U	0.025.0	0.025 U	0.025.0	0.00	0.0250
Endrin ketone	30000000	•		710						0.027	0.075	34.8	0.00923	0.363.8	D.52 U	0.12.0	0.02.0	0.02 U	0.00.0	0.00543	0.05.0
gemma-BHC (Undane)	0.2			0.038	0.079	0.034	7700		17100	9500	0.047	47)	0.023	130	₫ 426 U	0.0019 3	0.025.0	0.0033 3	0.0022 3	0.013 3	0.025 U
gamma-Oilordane				0 000	0.000	0 1	0.770	2 2		11.00	0.01111	41	0.32 (1)	300	0.026 U	0.025.0	0.025 U	0.025 U	0.025 U	0.05 U	0.025 U
Heptachlor	9.4			0.04.0	0.000	0 +30	0.000	0.40		0000	1 0200	W 7.	6.02 UB	130	U 625 U	0.025.0	0.02573	0.025 U	0.005.0	0.08.0	0.025 (
Heptachlor epoxide	ň			11.00	0.0770	0.64.0	4600	0.10	0.100		0.33	47.	0.035.1	-	0.10	010	0.10	010	010	0.013 3	010
Methosychion	4	5		040	0.21.0	0.10	010	0.00			:	N.	1111	1447	0.26.13	0.25 00	0.25.0	0.25 U	0.250	7	0.45.0
Toxaphene	3			1270	8.8 a	7.4 .	47.73	3.3.3.8	200	100			2001	En 27	53010	0.0735	0.0984	0.1641	0.1512	2,5609	0.0584
Total Pesticides	4	Mg/L 0.1335	14.459	20.546	15.925	15.442	13 225	13.34	7.557	5.602	5.943	MA	1.137	2700	0.16.00	200					
Matals		ı	ı						100	471	V-11	0.4.1	77	160 1 a	113	433	14.5	976	21/2	115	911
Oromium	M			VCA	Y!Y	νn:	5 :	V + 1	2 2			3	14	45.1	8.2 U	101	MA	VN.	VN	10.11	14.5
		And Real	NA.	VN.	VOI	WV	127	VN	NO.	MO	1771	7.0.7	100								

- Many-emperiller	- Semestal Coul	- Countried about Fin contribition	- Normal(Minnery Sample	- Field Daplicate	- Mod deductined	- Catanated value	<ul> <li>The waker was obtained during a secondary distrior.</li> </ul>	<ul> <li>Analyte was prenumptively present and tertifinely identified at the approximate concentration lated.</li> </ul>	- Not analyzed	Indirest, concentration exceeding R.C. during posted timeframe.
101	2			2	0	_	٥	2	NA	

Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-25

	Sample Location: Sample Date:	Date:	Sample Date: 08/20/2003 09	MW-25 09/08/2004	MW-25 11/16/2005	MW-25 12/13/2006	12.05/2007	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25	MW-25
	Somple	Types	z	z	z		1	N N				12/05/2011	12/10/2012	06/19/2013	8	12/12/2013	
Analyte	RG	Units									ž	2	z	z	Z	z	z
Posticides																	
4,4'-000	0.1	you	(1700)	074,000	105100	11.0524.11	1010 910	1125 945	*1.	*							
4,4°.00€	0.1	724	10000	0.0153		0.0200		1 00000	1	1	1.	. 101		0.00	11 (12 )	0.0084 3	1884
4,4°-00T	0.1	Y	1		0.00	Orderen.	+	00000	1	0.012.3				0.0143	0.0193	0.0213	1
Aldrin	0.000	100						0.0012.5	4	0,000653		1074		0.020	0.016 3	0.00653	11.36.1
aichaBHC	0,006	1 3		-110000				115.1	177	0.0036 3a	11.775	STC-WO	5.00	100,000	0.00434	0.0000474	0.001
detra Olechan		4		0.008138	2000	1000		10.647.34	1	0.3540,0	11.05-7 1	0.0078 3 a	0.0016 )	0.088 a	0.33 4	0.41 a	The second second
	,	No.		100	Charles Andrews	1 67 6	10000000	10.11.01	7	W. G. S. C.	0.011.3			1112211	0.0007	0,000	0.000
Deta-Duc	7000	you	0.2Da	0.29Da	0.3Da	0.34 a	0.353a	0.23DJa	-171	0.37 DJa	0.3 a	0.24 0	0.21 4	. 600	064	0.000	O'CO
Detach	0000	12		16:	11000000	17 453 11			7	0.00053	(risk)	0.00054.1	1 1 1 1	9 000	0.000	0.39.38	
Dedin	0.002	hg/		0.0143a	11 42664			0.0113a	5	11 10 11	0.0000		00000	auc a	nuas a	a con	0000
Endosulfan I		74		2.5.34	11000	0.000		0.0085.1			-		0000		0.02 a	0.0256 a	17 (2000)
Endosufan II		YEA			1 1	0.011.1	1,00	00131	10.11					0.028		0.320.0	0.250
Endosulfan suifate		Yen			5000	-										0.029	0.025 3
Endin	2	You	0.6500000		1   Californ						1,776			0.035 J		0.477	3 7 8
Endrin aldehyde		YBY.	0.000		(1000)	10000000		CEIMO	1	t o	14774			0.018 J		0.0123	11-11
Endrin kettone		You			Participant of						1000	1.00	7.54.45	11.070	0.0062 J		9.8.9
camma-BHC (Lindane)	2 11								3	0.0028 NJ	10.00	0.776	CONC.	0.04	0.13	0.16	0.23 3
damma-Olocdana					Y.		1111111		120	0.000893	0.00065 3	0.0095 3	0.00113	0.062	0.27 8	0.37 3.8	District
Mertadi		1					77.00	0.011.5	13	1	0.025			0.01	19100	19100	1,000
Disposit	5	Light.		0.0000	1.404	Service Control	0.4100	31.47.6	274	7000	0.0253.0			113,511		COTO	C to Ton
перволог еронде		Yth			C. 304 A.	0.000	0.41+33	1011	÷		0.0		of the Wilder Inc.	-			
Methoxydrior		72		100	100000	0.576			=					uuss			
Tozaphene	m	124			11 (4) 11	0.22.3									0.01		
Total Pestodes		York	0.2	0.3271	2.0	0.574	×	0 3000	6 1		9		9		6.1	123	7.1.2
Netals						1000	870	0.4373	1,61	0.409	03507	0.2627	0.2141	0.878	3.4212	2.9145	2.194
Chromum	100	Vort	1.0	374	274	2	514	1	421		2.9	21	8		I		
Lead	53	Von	250	100	7.4	151	**	1	1.43	d		91	1			423	7
											457.78	10-8-80	1777	101	-		-



Appendix E Historical Groundwater Results from 2003 to 2014Q1 Pesticides and Metals for MW-26

	Sample Location:	ation:	MW-26	MW-26	MW-26	MW-26	MW-36	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26	MW-26 09/05/2013	MW-26 12/12/2013	MW-26 03/24/2014
	Sample Date:	Date:	Sample Date: 08/20/2003	N 1002/80/60	11/16/2005 N	12/13/2006 N	12/05/2007 N	12/02/2008 N	03/18/2010 N	12/10/2009 N	11/30/2010 N	12/02/2011 N	N	N N	Z	z	z
Analyte	RG	Siles			1000	Christia										3	
Pesticides											117070	115,38	3,801	115-377	11.32.111	Sugerin	11.3000
44,000	0.1	Vori		11-20-0	6.00		1000	0.3500	No. of Charles						11 42 11	200 Calcalant	
4.4'.DDF	0.1	NO.	1000		17.72	0.0123	1,020,03	2,375.2		d.		1					
44'DOT	0.1	You	100	17.70	0.00079 3	0.000	1002.03	0.000,00	0.00113	Ę			6.		ALIGHED A		
2 4	cool	1	11.400	111000	0.1010	0.0115	100100	100	7 11811	S	100 1000 100	0.000	011000000	10000			
Agnin	7000	i			40.1000	0.0110	715317	11-02-17	1 1 1 1 1 1 1 1 1	41	1108	0.386.311	0.0651100	0.000	0		
alpha-B-C	9000	d ·	1000	1000	CA CALCALLA				1 2 2 3	4.	0.00133	0.8558.0	0.625.00	W 025 D	1 100	1000	0.570 0
alpha-Chlordane	ni.	2	0.0000							47	0.000	0.452.11	0.700	3.50	2524		
bets-BHC	0.02	704	2015	100							10.000.00	111111111	11163111	-11-0-11-	(1.00)	111000	11.00
delta-BHC	90000	Von	1000						STATE OF THE PARTY.	100	0.000	12.00	10 2450	116.5371	11.00.00	11000	10.700
Deldin	0.002	764	1000			0.012 Ja		The second	CONTRACTOR OF THE PARTY OF THE				1000	11.77.77	11.4.11	0.00	(C3/C2)
Endosulfan I		Vor	0.010	7 1000	0.004		-0.0115	2000000	10,000						11.34.117	0.025	4, 20, 6
Endosulfan II		VOT		0.000	A. (8)		0.00 7115	OF CANCELL	11 11 11	57			,		101.45.01	12-5/300	
Endosufan sulfate		79	100000	0.707	0.00	0.015 3	10.00	17.76.76		Ş	2				0.00	0.000	1.1.4.1.1
Fodin		You	A	0.000	Stores 22	0.0123	12 C. N.	1000	4	171	17 7 11	0.000					
Section of the selection	0	10.	34.01	100,000,000	0.00000	10000		11.04.5	6.141.0	477	100012 ft	015.70	CCC 25 11.		2.7		
and usos upon			1 20000	100000				0.000	7 77 7	40	0.000	0.5201	300,250,30		7	1000	
Endin ketone		¥ .	comm			1.0000	1,141		0.000	2.0	0.025545	0.00019	11 15 15		10.764	7 - 10	7 3
gamma-RHC (Lindane)		12	10.1					10.00	1000		3103545	130011	10.00	014.50	0.5710	0.000	110,511
gemma-Chlordane	2	10V							0.024011	d	10 FC3	1.00	11 2000		7	0.405.03	10,000,000
Heptachlor	0.4	10V	1100					1000000	0.000	4	1.00	1000	17.970.0	0,000	0.00		0.000
Heptachlor epoxide		νď	7.5	7 17 7			TAIL CT						1000			(A) (C) (A)	10,000
Methorychion		191				71001	0.000				19.0	11 35 0	6.561	0.35.0	0.75 to	0.00	0.84
Toughere	Э	VEH	0.0	0.40	3.00	-1-	1 1				0.0000	0,000					-
Total Pestiddes		10A	30	.01	0.0079	0.0556	12	100	0.0011	572	0.0013	61000					
Metals									3	4.50	u	231	8.4	*4	:5	283	4.1
Chromium	100	10V	77.	417	471	4,	1	4	1	7	3	200			77	9	1,2
Lead	15	10V	37.75	3733	742	175	vi.	it.	3	67.9	607	1000000					



SCD058753971 September 2014

Appendix E
Historical Groundwater Results from 2012 to 2014Q1
VOCS, Pesticides, and Metals for MW-27

		cambre countries.	/7-AAL	17-MW	17-MIN	17-MW	/7-MW
		Sample Date:	12/1	06/18/2013	09/04/2013	12/11/2013	03/24/2014
	9	Sample Type:	Z	z	z	z	z
Analyte	RG	Units					
VOCs							
Benzene	Ŋ	hg/L	10	IIA	NA	NA	NA
Toluene		hg/L	10	NA	NA	NA	V.
Ethylbenzene		hg/L	10	NA	NA	NA	MA
Xylene (Total)		hg/L	10	NA	NA	NA AN	NA
Pesticides							221
4,4'-DDD	0.1	hg/L	0.026 U3	9,025 U	0.025 U	0.025 U	0.02511
4,4'-DDE	0.1	ng/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.02511
4,4'-DDT	0.1	hg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	hg/L	0.0021 U	0.002 U	0.002 U	0.002 U	0.00Z U
alpha-BHC	900'0	hg/t	0.0062 U	0.006 U	0,006 U	0,006 U	0.006 U
alpha-Chlordane	2	ng/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.02	ng/L	0.0049 3	0.02 U	0.02 U	0.02 U	0.02 U
delta-BHC	9000	µg/L	0.0062 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	hg∕L	0.0021 UJ	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		µg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		hg∕L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		hg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	hg∕L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		hg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		µg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 UJ
gamma-BHC (Lindane)	0.2	hg/L	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	2	hg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	4.0	hg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		hg/L	0.026 UJ	0.025 U	0.025 U	0.025 ∪	0.025 U
Methoxychlor		ng/L	0.1.0	0.1 U	0.10	0.1 0.0	0.10
Toxaphene	m	hg/L	0.26 UJ	0.25 U	0.25 U	0.25 UJ	0.25 U
Total Pesticides		µg/L	0.0049	ם	0	)	_
Metals					MANAGER		
Chromium	100	1/6rl	5.0	AN	NA	0.5	NA
Lead	15	ng/L	3.8 J	MA	NA	1011	MIA

Notes: µg/L

Micrograms per liter

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Appendix E Historical Groundwater Results from 2012 to 2014Q1 VOCS, Pesticides, and Metals for MW-28

	•		00	00,777	OC WIN	MW-28	MW-28
	Sampl	Sample Location:	MW-28 12/12/2012	06/18/2013	09/04/2013	12/11/2013	03/24/2014
	Sa	Sample Type:	z	z	z	z	z
Analyte	RG	Units					
VOCs							
Benzene	5	hg/L	1 U	NA	NA	NA	NA
Toluene		hg/L	10	NA	A Z	AN	NA
Ethylbenzene		hg/L	1 0	NA	d Z	NA	NA
Xylene (Total)		hg/L	1.0	NA	NA	NA	NA
Pesticides							
4,4'-000	0.1	hg/L	0.026 UJ	0.0016 J	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	J/gr	0.026 U3	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	ng/L	0,026 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	hg/L	0.002 U	0.002 U	0.002 U	0.0023	0.002 U
alpha-BHC	9000	hg/L	0.0061 U	0.0036 J	0.006 U	0.006 U	0.006 U
alpha-Chlordane	2	ng/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.05	hg/L	0.02 U	0.15 a	0.24 a	0.096 a	0.17 a
delta-BHC	9000	J/B/L	0.0061 U	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	hg/L	0.002 UJ	0.002 U	0.0026 a	0.002 U	0.002 U
Endosulfan I		J/Br/	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		hg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		hg/L	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin	2	ng/L	0.026 U	0.00113	0.025 U	0.025 U	0.025 U
Endrin aldehyde		hg/L	0.026 UJ	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		hg/L	0.026 U	0.0041 3	0.0087 J	0.0033 J	0.0056 J
gamma-BHC (Lindane)	0.2	J/gr	0.02 U	0.02 U	0.0057 J	0.02 ∪	0.0034 J
gamma-Chlordane	2	µg/L	0.026 U3	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	4.0	hg/L	0.026 UJ	0.025 U	0.025 ∪	0.025 U	0.025 U
Heptachlor epoxide		µg/L	0.026 UJ	0.025 U	0.025 U	0,025 U	0.025 U
Methoxychlor		hg/L	0.002 J	0.1 ∪	0.1 U	0.1 UJ	0.0021 J
Toxaphene	3	J/gr	0.26 UJ	0.25 U	0.25 U	0.25 UJ	0.25 U
Total Pesticides		hg/L	0.002	0.1604	0.257	0.1013	0.1811
Metals							
Chromium	100	1/6rl	n s	NA	AN	2.2.3	A
pea l	15	na/L	4.3.1	NA	NA	10 U	NA

Motes:

µg/L = Micrograms per liter

RG = Remedial Goal

a Concentration Exceeds RG

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Appendix E
Historical Groundwater Results from 2012 to 2014Q1
VOCS, Pesticides, and Metals for MW-29

			•				
	Sample	Sample Location:	MW-29	MW-29	MW-29	MW-29	MW-29
	Sar	Sample Date:	12/11/2012 N	06/18/2013	09/03/2013	12/11/2013	03/24/2014
Analyte	88	Unite	:	:	2	z	Z
VOCS							
Benzene	S	J/DI/	1.0	MA	ΔN	AN	NA
Toluene		ng/L	10	NA	NA	AN	NA
Ethylbenzene		Ug/L	1 0	NA	NA	NA	N.
Xylene (Total)		Hg/L	10	NA	NA	NA	Ā
Pesticides							
4,4'-DDD	0.1	hg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDE	0.1	LIG/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
4,4'-DDT	0.1	hg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Aldrin	0.002	ng/L	0.002 U	0.0045 Ja	0.002 U	0.002 U	0.002 U
alpha-BHC	9000	hg/L	0.0061 U	0.0006	0.006 U	U 000 U	0.006 U
alpha-Chlordane	7	J/Br/	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
beta-BHC	0.05	hg/L	0.02 U	0.02 ∪	0.02 U	0.02 U	0.02 U
delta-BHC	9000	ng/L	0.00010	0.006 U	0.006 U	0.006 U	0.006 U
Dieldrin	0.002	ng/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Endosulfan I		ng/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan II		ug/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endosulfan sulfate		hg/L	0.025 U	0.0011 3	0.025 U	0.025 U	0.025 U
Endrin	7	ug/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ
Endrin ketone		J/gr/	0.025 U	0.025 U	0.025 U	0.025 U	0.025 UJ
gamma-BHC (Lindane)	0.2	Hg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
gamma-Chlordane	7	µg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Heptachlor	4.0	hg/L	0.025 U	0.025 ∪	0.025 U	0.025 U	0.025 U
Heptachlor epoxide		hg/L	0.025 U	0.025 U	0.0032 3	0.025 U	0.025 U
Methoxychlor		Hg/L	0.1.0	0.10	0.1 U	0.1 U3	0.1.0
Toxaphene	e	µg/L	0.25 U	0.25 U	0.25 U	0.25 U3	0.25 U
Total Pesticides		hg/L	П	95000	0.0032	ח	0
Metals						STANSON OF THE PARTY OF THE PAR	
Chromium	100	ng/L	9.6	NA	NA	8.8	NA
Lead	15	hg/L	2.6 3	NA	NA	10 U	NA

Micrograms per liter
HG = Remedial Goal

Appendix E
Historical Groundwater Results from 2012 to 2014Q1
VOCS, Pesticides, and Metals for MW-33

	Comp	Cample Location.	LEWY 33	P. W. 17	MW.73	MW-22	MW-33	MW-33	MW-33	MW-33	MW-33	MW-33
	S	mple Date:	12/11/2012	Sample Date: 12/11/2012 12/11/2012	8	8		09/04/2013 09/04/2013 12/11/2013	12/11/2013		12/11/2013 03/25/2014 03/25/2014	03/25/2014
	ď	Sample Type:	z	0				æ	z	9	z	9
Analyte	RG	Units										
VOCS												
Berzene	5	Visid	0.1	11.11	V#2	111	VN.	VII	VN.	NA	MA	NA
Toluene		hg/L	=	= -	VAV	111	NA	NA	MA	NA	ALX.	VA.
Ethy benzene		/m	2	1.0	F4A	144	N.A	VIA	NA	MA	11V	NA
Xylene (Total)		νgη	111	11	NA	147	MA	11/4	NA	NA	14.5	12.4
Pesticides												
4,4'.DDD	1.0	1/5/1	0.850.0	0.025.0	0.02511	0.025.0	0.00123	0.02511	0.025 0	0.025.0	0.025 U	0.02511
4,4°DOE	0.1	V <sub>B</sub> rd	0.025.0	0.025.0	0.02550	0.025.0	0.0250	0.025.03	0.025 U	0.025.0	0.025.0	0.07811
4,4 DDT	0.1	1/01	0.02511	0.0258	0.025 U	0.025 U	0.025 U	0.025.01	0.0027 NJ	0.0031 3	0.025 U	0.025 U
Aldrin	0.002	1/Bri	0.00241	0.00231	0.002.0	0.002.0	0.00073	0.002.0	0.007.03	0.002.0	0.002103	0.0007.03
alpha-BHC	9000	1/8rd	0.00011	U 1000 U	0.00611	0.0011 3	0.0000	0.00611	0.006.0	0.006 U	10.000 0	0.000.0
alpha-Chlordane	~	1/64	0.02544	0.0250	0.025 U	0.0251	0.02500	0.02514	0.02511	0.02541	0.02511	0.02511
beta BHC	0.02	ğ	0.0211	0.02 U	0.02.0	0.02 U	0.02 U	11 (0.0	0.0241	0.02.0	0.000	0.02.0
delta-BHC	900'0	No.	U 1500 U	0.1900.0	0.000.0	0.006 tu	0.006.0	0.000 0	0.006 U	0.000 U	0.006 U	0.0000
Deith	0.002	/gr	0.002.0	0.0020	0.002 U	0.0021	0.0020	0.002.0	0.002 U	0.00210	0.002 U	0.002.0
Endosulfan		1/0/1	0.025 (3	0.025 U	0.0024 3	0.025 tu	0.00323	0.0024 3	0.0028 3	0.025 U	0.025 11	0.025 U
Endosultan II		Z,	0.0250	0.0250	0.0051 3	0.0033	0.025 U	0.02511	0.02511	0.02511	0.025.0	0.02511
Endosulfan sulfate		harl	0.02830	0.02511	0.02514	0.0025 3	0.02517	0.025.0	0.025.03	0.025.0	0.025.0	0.025 U
Endrin	7	1/bri	0.025 U.3	0.025 0.0	0.02519	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Endrin aldehyde		1/bri	0.025 U	0.02519	0.025 U	0.025 U	0.00543	0.025 U	0.02513	0.025 U	0.025 U.I	0.025111
Endrin ketone		V/Dri	0.025 U	0.025.0	0.00123	0.925 U	0.025.0	0.025 U	0.025.0	0.025 U	0.025.01	0.02511
gamma-BHC (Lindane)	0.2	Lpt.	0.0243	0.021	0.000	0.024	0.02.0	0.02.03	1170'0	0.07 (1	0.02 UI	0.9241
gamma-Chlordane	2	1/dri	0.0039	0.0042.3	0.025.0	0.075 U	0,0028 3	0.019 3	0.025.0	0.02543	0.025 (1.	0.025 U
Heptachlor	0.4	Ng/	0.025.0	0.0254	0.02511	0.025 U	0.82511	0.025.0	0.025.0	0.025 (1	0.025.01	0.02501
Heptachlor epoxide		Von	0.025.0	0.025.0	0.02513	0.075.0	0.02511	0.025.03	0.025 U	0.025 U	0.02511	0.075.01
Methoxychior		Von	0.1.0	0.1.0	0.1.0	0.1.0	0.1.0	0.1.0	0.1 UJ	0.1 0.1	0.1 U	0.0021 3
Toxaphene	2	Jugy.	0.25 0.	0.25 UI	0.15 NJ	0.14 NJ	0.48 )	0.423	0.243	· ·	0.25 U	0.25 U
<b>Total Pesticides</b>		Non	0.0039	0.0042	0.1587	0.1466	0.4926	0.4114	0.2455	0.0031	(1)	0.0021
Metals												
Онотып	100	1/firl	5.2	3.23	NA	18.8	NA	114	2.0	s	144	NA
Lead	15	1/6/1	5.2.3	423	FUA	MA	11.4	71.4	101	10.01	MA	NA



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Appendix E
Historical Groundwater Results from 2012 to 2014Q1
VOCS, Pesticides, and Metals for MW-34

		cumple cocations	MW-34	MW-34	MW-34	MW-34	MW-34
	vī v	Sample Date:	12/10/2012	06/18/2013	09/04/2013	12/11/2013	03/26/2014
Analyte	ň ď	Sample Type:	z	Z	z	z	z
VOCs		SIIIO					
Benzene	u	1/011					
	1	hy/L	7	NA	NA	NA	NA
loinene		µg/L	10	NA	NA	NA	NA
Ethylbenzene		µg/L	10	NA	NA	NA	NA
Xylene (Total)		hg/L	) ]	NA	NA	NA	V N
Pesticides						YA!	MA
4,4'-DDD	0.1	ng/L	0.00723	0.025 U	0.02511	0.03511	11 36 0
4,4'-DDE	0.1	ng/L	0.025 UR	0.02511	0.02511	0 520.0	0.63.0
4,4'-DDT	0.1	J/Br/	0.015 J	0.02511	0.025.0	0.020.0	0.25.0
Aldrin	0.002	na/L	0.007 UR	0.00211	0.023.0	0.025 U	0.0223
alpha-BHC	0.006	no/l	0.0061 110	0.00511	0.002.0	0.002 0	0.02 U
alpha-Chlordane	2	1/01	0.035 (10	20000	0.0011	0.006 U	0.06 U
beta-BHC	0 0	7	AO 530.0	0.025.0	0.025 U	0.025 U	0.25 U
CERPENT.	20.0	776	0.02 UK	0.02 U	0.02 U	0.02 U	0.2 U
	0.00	Dg/L	0.0061 UR	0.006 U	0.006 U	0.006 U	0.06 ∪
Melann	0.002	ng/L	0.002 UR	0.001 3	0.002 U	0.002 U	0.02 U
Endosultan I		hg/L	0.025 UR	0.025 U	0.025 U	0.025 U	0.25 U
Endosultan II		hg/L	0.025 UR	0.025 U	0.025 U	0.025 U	0.25 U
Endosulfan sulfate		hg/L	0.025 UR	0.0054 3	0.025 U	0.025 U	0.25 U
Endrin	2	hg/L	0.025 UR	0.025 U	0.025 U	0.025 U	0.2511
Endrin aldehyde		hg/L	0.01	0.047	0.025 U	0.025 U	0.2511
Endrin ketone		hg/L	0.025 UR	0.025 U	0.025 U	0.0024 3	0.25111
gamma-BHC (Lindane)	0.2	hg/L	0.02 UR	0.02 U	0.02 U	0.02 11	1160
gamma-Chlordane	7	hg∕L	0.025 UJ	0.025 U	0.025 U	0.025 U	0.251
Heptachlor	4.0	ng/L	0.025 UR	0.025 U	0.025 U	0.025 U	0.25 U
Heptachlor epoxide		ng/L	0.025 UR	0.025 U	0.0032 J	0.025 U	0.25 U
Methoxychlor		hg/L	0.1 UR	0.0055 J	0.1 U	0.1 (1)	111
Toxaphene	٣	Hg/L	0.25 UR	0.25 U	0.78 3	0.25 U	2511
Total Pesticides		hg/L	0.0322	0.0589	0.7843	0.0024	0.022
Metals							
Chromium	100	hg/L	9.0	NA	NA	11	NA
Lead	15	ng/L	3.1 J	NA	NA	101	MA

# Appendix F: Photographs from Site Inspection Visit

Photo Log for Site Inspection – Helena Chemical - Fairfax





Photo 1 – South towards office and inspection team



Photo 2 - Warehouse



Photo 3 – Fence on east side of property



Photo 4 – Eastern side of the warehouse



Photo 5 - Fire hydrant on east side of property

Photo 6 - MW14







Photo 8 - Tree on fence; northeast corner of grid C



Photo 9 – MWs 5 and 8



Photo 10 – Warehouse (facing south)



Photo 11 - MW4

Photo 12 - Pump and treat system shed





Photo 13 – recovery well cluster and MW4



Photo 14 - MW south of recovery well and MW4

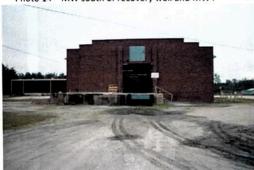


Photo 15 - Out of service monitoring well



Photo 17 – Facing north towards recovery well



Photo 18 - Sampling at MW 15 and 16



Photo 19 – Limbs on fence (western edge of property)



Photo 20 – Facing east



Photo 21 - Fence along western edge of property



Photo 22 – Hole under fence on southern side of property



Photo 23 - Facing south toward MW cluster at old lumber mill



Photo 24 - MWs 1 and 2



Photo 25 – Facing north



Photo 26 -Trash dumped outside fence south of site



Photo 27 – Trash dumped outside fence south of site



Photo 28 – Trash dumped outside fence south of site



Photo 29 - MWs 33 and 34



Photo 30 - Former lumber mill





Photo 31 – Former lumber mill



Photo 32 – MWs 31 and 32 being sampled in distance



Photo 33 - MW 10

Photo 34 – Helena Chemical Company sign





Photo 35 – Corbett Plywood sign





Photo 38 - MW 21 and 22 facing north



Photo 39 - MW 28



Photo 40 - MW 27



Photo 41 – MWs 27 and 28 facing south



Photo 42 - MW 29

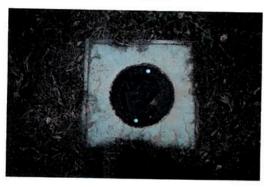


Photo 43 - MW 30



Photo 44 – MWs 29 and 30 facing west



Photo 45 - MW 32



Photo 46 - MW 31



Photo 47 - MWs 31 and 32 facing north



Photo 48 - MW 26

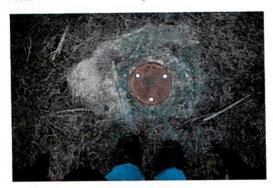


Photo 49 - MW 25



Photo 50 - MWs 25 and 26 facing south



Photo 51 – MW 3 and 6



Photo 52 - MWs 17 and 18



Photo 53 – Public water well near MW 17



Photo 54 – Public water well tag (off of Aiken Ave)



Photo 55 - Public well off of Aiken Ave



Photo 56 - New pumps/backup generators off of Aiken Ave

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			×		
					×